

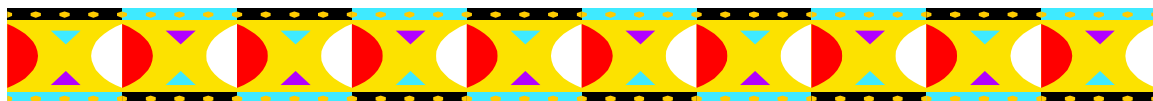


# **Arts Education Research Compendium**

**Produced by the Beverly Taylor Sorenson  
A.R.T.S. Initiative of the McKay School of  
Education at Brigham Young University**

**and**

**The Utah Division of Arts & Museums  
Arts Education Program**



# Arts Education Research Compendium

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# **Arts Education Research Compendium**

## **Introduction**

This Arts Research Compendium is a collection of citations from arts education research articles, sorted by topics pertinent to arts education. It was compiled by Kalli Kronmiller, a part-time research faculty member in the Beverly Taylor Sorenson A.R.T.S. Initiative of the McKay School of Education at Brigham Young University. Later additions and editing were done by Jean Tokuda Irwin and Alyssa Hickman Grove of the Utah Division of Arts and Museums' Arts Education Program. Its purpose is to organize and keep track of the vast amount of information found in arts education research articles, with particular attention paid to the outcomes of the arts in education. The Arts Research Compendium is not comprehensive of all existing arts research, but, rather, is a work in progress containing a variety of research articles, to which additional research may be added. Feedback and suggestions concerning ways in which the Arts Research Compendium can be improved are welcomed and may be sent to [byuart@gmail.com](mailto:byuart@gmail.com) or [jirwin@utah.gov](mailto:jirwin@utah.gov).

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## 21<sup>st</sup>-Century Skills

**2008** The reality of life in the 21st century is that the skills associated with artistic practices — creative thinking, self-discipline, collaboration and innovation — are skills that are in great demand. In fact, in our rapidly changing global economy, the skills the arts teach may be mandatory for everyone's success (p. 26).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** In 10 years, the prototypical U.S. industry will be engaged in “creative work” — research, development, marketing and sales and global supply chain management. These areas depend on leadership rooted in creativity, imagination and the arts. ... a major threat to America's global competitiveness is the decades-long erosion of the arts — dance, music, theatre and the visual arts — in our educational system, which has been exacerbated by federal legislation failing to live up to its promise to prepare all young people for success in the 21st century. Eliminating the arts because of arbitrary policies or lack of adequate funding only further removes U.S. students from a curriculum that fosters 21st century skills for 21st century jobs (p. 27).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** If students are to succeed in today's complex economy, they need to know more than just English, math, science, and history. They also need a range of analytic and workplace skills. Mastering those skills means learning how to think critically and creatively, work collaboratively, use the Internet to do research, and communicate clearly and effectively. Students also need to be responsible and accountable, to be up on the news, and to have a workable knowledge of economics and business.

(Lehigh, S. (2008, November 19). Teaching students 21<sup>st</sup>-century skills. *The Boston Globe*, Retrieved 11/24/08 from [http://www.boston.com/bostonglobe/editorial\\_opinion/oped/articles/2008/11/19/teaching\\_students\\_21st\\_century\\_skills/](http://www.boston.com/bostonglobe/editorial_opinion/oped/articles/2008/11/19/teaching_students_21st_century_skills/).)

**2008** Different tools are needed to assess such skills, including performance assessments like speeches, projects, and exhibitions. Clearly, multiple-choice tests short written essays are not up to the task. ... Some fear that moving beyond our current focus on high-stakes testing and toward multiple measures will mean lowered standards. This argument falsely assumes tests themselves are standards. The fact is that too many schools are now narrowly focused on preparing kids for tests, not educating the whole child. ... Many students are engaged by arts instruction, and when students are engaged their overall motivation to learn improves.

(Guisbond, L. (2008, December 8). Art's power to teach 21<sup>st</sup>-century skills. *The Boston Globe*. Retrieved from <http://r.smartbrief.com/resp/nqbgryypnxvcmyCibSgfdQsO?format=standard>.)

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**2007** The National Governors Association concurs that the arts provide a competitive advantage. Its report, *The Impact of Arts Education on Workforce Preparation*, points out that the arts help build the workforce of tomorrow (2002). It describes how arts-based education increases academic performance and lowers juvenile crime. In school and after-school programs the arts are providing to be “innovative and cost-effective ways to produce successful students and productive employees.” (Access report online at: [www.nga.org](http://www.nga.org).) (p. 23).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Involvement in the arts prepares students to solve future problems by encouraging risk taking, experimentation, and freedom to fail. Finding multiple solutions, trying new ideas, and capitalizing on mistakes are artistic orientations. As Aristotle observed, “Art loves chance. He who errs willingly is the artist” (p. 23).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** The arts deliver precisely the kinds of thinking and working skills needed in the workplace of the new millennium: analysis, synthesis, evaluation, and critical judgment. The arts nourish imagination and creativity while focusing deliberately on content and end products. The workplace demands collaboration and teamwork, technological competencies, flexible thinking, an appreciation for diversity, and self-discipline—all of which are integral to arts learning. Arts-based education also boosts school attendance and communication skills. The arts contribute to lower recidivism rates, increased self-esteem, and the acquisition of job skills, especially for at-risk populations. The arts give students an understanding of the skill, discipline, perseverance, and sacrifice necessary for achievement in the workplace and in personal life (p. 24).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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## Anecdotal Evidence

**2008** J.D. Jerome (1899-1992) was an educator in the 1930s. He truly loved his job and shared his enthusiasm with everyone around him. He began every faculty meeting with singing and he closed every school day with a song (p. 50).

(Jerome, S. (2008). Bringing the arts front and center. *School Administrator*, 65, 3, 50.)

**2008** A new superintendent in northern California recently asked: “Why would I pay 12 music teachers when my students can’t read?” With his school district’s largely black and brown students testing far below basic levels in the subjects for which educators are now held accountable, that question raises the difficult choices district leaders face: How can limited funds be most equitably allocated to benefit needy and deserving children and communities? Another superintendent in an adjacent school district has wrestled for six years with this challenge. Despite extra attention to math and reading skills, many students in her district continue to be labeled “chronically and persistently far-below-basic.” She’s trying something new — a longitudinal action-research project to equip her teachers to use arts as learning resources. By helping teachers link authentic arts learning with English language learning, the project will support teachers in building arts and teaching skills to better engage the neediest students. They’ll learn to use arts to motivate thinking, speaking, reading and writing and, beyond motivation, to make students’ learning visible so teachers can better target instruction to individual needs. The county superintendent is impressed, and she’s bringing all 18 superintendents in the county together to consider such arts-infused strategies (p. 14).

(Hetland, L. (2008). Basically, arts are basic. *School Administrator*, 65, 3, 14-15.)

**2008** In rural communities throughout New England, the nonprofit Education Development Center has been implementing its SMART Schools program, an arts-based, whole-school redesign. In 16 schools in New Hampshire, Rhode Island and Vermont, the SMART Schools program has realized proven results, producing high academic achievement while implementing an arts-focused curriculum.

The SMART Schools philosophy is centered on five key design elements:

- \* Teaching all four artistic disciplines of dance, music, theatre and visual arts to every student every day — including teaching the arts as discrete subjects as well as arts integration to connect the arts standards and other subject standards;
- \* Developing and implementing rigorous standards-based, arts-infused curriculum, instruction and performance assessments;
- \* Fostering an inclusive school culture;
- \* Cultivating professional learning communities; and

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\* Building community partnerships (p. 20).

(Levin, K. R. (2008). Bucking trends: Expanding the arts. *School Administrator*, 65, 3, 18-25.)

**2008** James Halley, superintendent in the North Kingstown, R.I., schools from 1995 through 2007, says he was particularly impressed by the changes in instruction that the program brought to teachers who participated. In addition to using the arts and multiple intelligence concepts in every lesson, the teachers became risk takers themselves and encouraged risk taking on the part of students (p. 20).

(Levin, K. R. (2008). Bucking trends: Expanding the arts. *School Administrator*, 65, 3, 18-25.)

**2008** Perhaps the most noteworthy example of bringing arts education to scale is found in the Dallas Independent School District. Through the Dallas Arts Learning Initiative, all 300,000 students in the 157 elementary schools will have arts education programs by this September. ... Three major components form the foundation in Dallas: standards-based fine arts instruction, including 45 minutes of weekly art and music instruction; integration of arts and culture with other curriculum subjects, including programming by museums and performing arts groups; and out-of-school programs that provide access of inner-city kids and their families to arts experiences. Arts integration approaches include having teaching artists work with middle school students to use creative writing, visual art and digital media to express their views of the world. The arts initiative works with teachers to help them position the arts as a resource for teaching science, math, social studies and language arts. One innovative program developed by a local dancer combines curriculum in dance and geography (p. 22).

(Levin, K. R. (2008). Bucking trends: Expanding the arts. *School Administrator*, 65, 3, 18-25.)

**2008** A growing community with 21,000 students in 20 schools, Dorchester has taken an interesting approach to expanding arts opportunities by creating arts-integrated middle schools and gradually expanding arts activities throughout the district led by Larry Bamfield, the district fine arts coordinator. To attend the Rollings Middle School of the Arts, 5th graders apply for an audition that does not include an academic review. Each year, 200 students are selected to enter the 6th grade class, where they receive intensive training in their area of choice: dance, piano, strings, theatre arts, visual arts or vocal music. Students are selected from various backgrounds, yielding a diverse environment (p. 24-25).

(Levin, K. R. (2008). Bucking trends: Expanding the arts. *School Administrator*, 65, 3, 18-25.)

**2008** Warren County, Pa.: Classroom teachers in the 5,400-student Warren County Schools in rural North Warren, Pa., receive special training on how to integrate the arts into the core subjects, thanks to the U.S. Department of Education's Arts in Education Model Development and Dissemination grant program (p. 25).

(Levin, K. R. (2008). Bucking trends: Expanding the arts. *School Administrator*, 65, 3, 18-25.)



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**2008** More than 10 years ago in New York's South Bronx, the poorest congressional district in the nation, a small school called St. Augustine boasted that 9.5 percent of its students read at or above grade level and 95 percent met New York state academic standards. These were highly significant achievements especially for a student population that was 100 percent minority, with many of the children living in single-parent homes in communities plagued by AIDS, crime, substance abuse and violence. What was the secret of the school's success? St. Augustine infused every discipline — math, history, science and biology — with dance, music, creative writing and visual arts (p. 35).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** Dallas fourth-graders in the James S. Hogg Elementary School have spent several weeks each fall studying 19<sup>th</sup>-century pioneer lives in the American Southwest. Their understanding of this dynamic era initially came from classroom discussions and library books. But now the school is teaming up with local artists and cultural institutions to make this history theme more arts-enriched. Students are involved in group and individual projects to help them understand deeper the meanings of culture, tradition, and historical significance. They noted that learning is more fun and their Texas state test scores in social studies are rising. ...

Superintendent of the school district:

'In Texas there's almost as much pressure for teachers to boost test scores as there is for coaches to win football games. Here in Dallas there's probably more. If anyone wants to criticize [our arts program] as fluff, they should look at the test scores.

Initial analysis of standardized tests administered throughout the district show that students in the above program achieved a 10-point gain over a control group that achieved only a 3-point gain on the same material (p. 17).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** In order to make literature meaningful, students must be given aesthetic opportunities to respond to the printed text. Smith and Herring further shared five activities designed to create an active learning environment. First, students used expressive writing to respond to the themes in a novel. Next, students engaged in creative movement to maneuver through the setting of the story. Third, students were encouraged to use visual arts to illustrate their feelings or knowledge of the book. Fourth, students used exploratory music to respond to a segment of the text. Through this activity students selected a portion of the text to share. Once they had made their selections, the students chose music that would reflect the mood of the passage. Then, the students played the music or provided sound effects in the background while the passage was read orally. The fifth activity involved the use of informal drama. This was a type of improvisation theater in which pairs of students re-created dialogue from the text. ... Each of the responses from the students indicated that their comprehension of the text was increased and that their motivation for reading was enhanced (p. 17).

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(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2007** As a child, I'd never met anyone who had gone to college. The highest aspiration in my neighborhood was to stay out of jail and get a union job—and not all of my relatives managed to achieve either of those goals. Everyone had a relative in jail, whether for something small or big. Many people in my neighborhood had failed to finish high school. The reason that I am where I am today is not because of Harvard or Stanford. It is because of poetry, music, and art (p. 13).

(Gioia, D. (2007). Pleasure, beauty, and wonder: The role of the arts in liberal education. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 11-16). Washington, D.C.: Thomas B. Fordham Institute.)

**2006** Nick Jaffe's K-8 students create, perform, critique, engineer, and produce dozens of original projects in music recording classes at a Chicago elementary school (p. 61). ... The majority of competent engineers and technical specialists are female students. Kids who have a terrible time collaborating end up directing complex productions, sometimes working with their 'enemies.' Bookish kids end up singing or rapping. Students with social or emotional problems show amazing focus and intensity, taking on tasks they find most frustrating in regular classrooms. Students with writing difficulties spend hours writing lyrics. Problem students often show exceptional creative depth and come up with more sophisticated musical and artistic ideas than their peers do (p. 62).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2006** One fall day, we watched 4<sup>th</sup> graders in a low-income inner city school drawing portraits of one another in a lesson that was part of a unit on descriptive writing. The students were focused and excited. Rich writing and art covered the classroom walls and showed evidence of real learning and accomplishment. Most other classrooms in this school also integrated the arts with other subjects. The classrooms buzzed with intensity. On the same day, we observed 4<sup>th</sup> graders in another school. They were bored and slumping in their chairs as they waited to read aloud a bit of advice that the teacher had asked them to write for their classmates. They mumbled, "Don't hit your sister," and "Do your homework." There was no student work on the walls, no evidence of learning. Instead, hallway posters reminded students of rules they must follow. "Stay in line." "Don't forget your uniform" (p. 63).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2005** Can going to an art museum make elementary school students better learners? ... teachers in the role of facilitators share with their students—most of them in grades three through five—an image of a carefully selected work of art and pose three questions: 1. What's going on in this picture? 2. What do you see that makes you say that? 3. What else can you find? Teachers skillfully paraphrase each student's response, a step that demonstrates active listening and language use, validates individual views, and reinforces a range of ideas. ... students build on each other's insights to collectively construct

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meaning for the work under discussion. ... “[Students] are not as argumentative as they were, and they work better in groups, because I think they respect each other’s opinion a little bit more than before” (p. 56-57).

(Longhenry, S. (2005). Thinking through art at the Boston museum of fine arts. SchoolArts; *The Art Education Magazine for Teachers*, 104, 7, 56-57.)

**2001** Harvard psychologist Jessica Davis, who directs an arts-in-education program, has seen this kind of discovery at work in an inner-city school in the South Bronx. There, she recounts, a member of the Bronx Dance Theater teaches ballet twice a week to fourth-graders who happen to have the lowest reading scores in the city. The principal insisted that the visiting dance instructor conduct classes on Mondays and Fridays, the days when students’ attendance was at its lowest. As the principal expected, the students fell in love with dance, and their attendance—and their reading scores—shot up (p. 31).

(Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)

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## Arts Advocacy

### ***Arts: An Important Part of Education***

**2007** “If it’s important, you make the time.”... art is not an extra that can be indulged in when time permits, but rather an essential ingredient of superior academic instruction (p. 80).

(Reeves, D. (2007). Academics and the arts. *Educational Leadership*, 80-81.)

**2007** Establish a norm that there is no such thing as a ‘nonacademic’ class in school and that every subject, including the arts, is worthy of the thought and discipline that we associate with academic study (p. 80-81).

(Reeves, D. (2007). Academics and the arts. *Educational Leadership*, 80-81.)

**2007** The case for arts based learning is convincing enough that in 2004 Secretary of Education Rod Paige wrote a personal letter to all school superintendents emphasizing the significance of the arts in achievement. He reminded the nation’s educational leaders “the arts are a core academic subject under the *No Child Left Behind Act*” and lamented the “disturbing and just plain wrong” notion that NCLB should be used to shrink the role of the arts in schools. He refers to the National Longitudinal Study of 25,000 students, which showed a strong correlation between the arts and better test scores. What’s more, high arts students “performed more community service, watched fewer hours of television, reported less boredom in school, and were less likely to drop out of school.” Paige points out that the findings held for students from the lowest socioeconomic quartile “belying the assumption that socioeconomic status, rather than arts engagement, contributes to such gains in academic achievement and social involvement.” Read Paige’s letter at [www.ed.gov/policy/elsec/guid/secletter/040701.html](http://www.ed.gov/policy/elsec/guid/secletter/040701.html) (p. 15).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Everything that counts isn’t countable and what we can count may not count. Many well-rounded successful people were not straight A students. High scores do not guarantee desirable social and moral behavior. What matters most in a broader view of success? Ferrero (2005) reminds us “schooling is always and inevitably about cultivating persons” (p. 15).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** In a May 2005 speech, Assistant Secretary, U.S. Department of Education, Susan Scalafani called learning in and through the arts “central” to fulfilling the NCLB’s goal of improved student achievement (p. 22).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2007** A May 2005 Harris poll shows the American public overwhelmingly believes the arts are vital to a well-rounded education (p. 16).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2005** This publication presents commentary by Governor Mike Huckabee, who also was Chairman of the Education Commission of the States in 2005, and former U.S. Secretary of Education Rod Paige promoting arts education's influence on the development of critical analysis skills. Introduces "The Arts: A Lifetime of Learning," a program implemented by the Education Commission of the States that aims to use public awareness, research, analytical tools, and leadership efforts to "increase the arts' stature in education."  
(Huckabee, M. & Paige, R. (2005). Putting arts education front and center. *Americans for the Arts*. [http://ww3.artsusa.org/services/arts\\_education/arts\\_education\\_012.asp](http://ww3.artsusa.org/services/arts_education/arts_education_012.asp))

**2000** An education without music or the other arts is an impoverished education, and our children deserve better (p. 226).  
(Hetland, L. (2000). Learning to make music enhances spatial reasoning. *Journal of Aesthetic Education*, 34, 3-4, 179-227.)

## Arts Approach Learning Through Multiple Perspectives

**2008** School instruction caters to the logical-mathematical and linguistic intelligences ignoring the other six potential intelligences possessed by students. The additional six intelligences are identified by Gardner as (a) bodily kinesthetic, (b) musical, (c) spatial, (d) interpersonal, (e) intrapersonal, and (f) naturalistic. Gardner supports the notion that these intelligences are strongly rooted in the arts. ... By involving students in learning catered to their specific intelligence strengths, they will become more active participants in the learning process (p. 22).  
(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Physical sensation and emotion are essential components of the mind, as integral to thought and learning as logic is. In fact, some researchers note that logic may not be possible without sensation and emotion. It is ironic, then, that the arts are frequently dismissed as merely emotional, not cognitive. Thus, the very emotional and personal content of the arts are part of what causes the arts to become cognitively powerful (p. 14).  
(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2006** Physical sensation and emotion are essential components of the mind, as integral to thought and learning as logic is. In fact, logic may not be possible without them. It is ironic, then, that the arts are frequently dismissed as "merely" emotional, not cognitive. Their emotional content is part of what makes them cognitively powerful (p. 63).

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(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2007** Education, true education, should liberate; it should cultivate the genuinely free man, the man of moral judgment, of intellectual integrity; it should give us the power to see the other side; it should impart nobility of purpose and kindness of spirit. It should leave with us the inescapable truth that man is a spiritual being and that the struggle for the mastery of the forces of nature is not merely for the satisfaction of human needs but is also inspired by the spiritual and of reaching out beyond our immediate lives to something eternal (p. 4).

(Finn, C. E. & Ravitch, D. (2007). Why liberal learning. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 1-10). Washington, D.C.: Thomas B. Fordham Institute.)

**2001** As the Teachers College researchers said in their report, studying the arts engages students in a “constellation” of learning that interacts in multiple ways with learning in other school subjects as well as in other dimensions of the students’ emotional and social lives. Learning to act, compose music, or design a building draws on and reinforces habits of mind and personal dispositions at work in other school subjects and social settings. Indeed, these interrelationships are the fundamental premise of formal education: What you learn today will be applied in multiple ways now and in the future (p. 38).

(Deasy, R. J. & Fubright, H. M. (2001). The arts’ impact on learning. *Education Week*, 20, 19, 34-35.)

**1998** ... various art forms will differ in the degree to which they obviously involved skills that are used in academic areas; ... we might separate the academic effects of learning *in the arts*, such as skills gained from taking music or water-color painting lessons, from the academic effects of learning *through the arts*, such as using historical paintings or dramatizing key historical moments to learn about the past. ... “A willingness to imagine possibilities that are not now, but which might become. A desire to explore ambiguity, to be willing to forestall premature closure in pursuing resolutions. The ability to recognize and accept the multiple perspectives and resolutions that work in the arts celebrate.” ... I strongly suspect that a panel composed of math, science, history, foreign language, and elementary teachers would judge unanimously that students developing these dispositions would be more likely to succeed in school than students who did not, and that these dispositional outcomes of arts education would tend to boost academic achievements to some degree (p. 11).

(Catterall, J. S. (1998). Does experience in the arts boost academic achievement? A response to Eisner. *Art Education*, 6-11.)

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## Arts Complement Other Academic Areas

**2008** Robert Root-Bernstein, a biochemist and MacArthur prizewinner, studied 150 eminent scientists from Pasteur to Einstein. His findings were startling to those educators lobbying for more emphasis on the sciences, for he discovered that nearly all of the great inventors and scientists were also musicians, artists, writers or poets. Galileo was a poet and literary critic. Einstein was a passionate student of the violin. And Samuel Morse, the father of telecommunications and inventor of the telegraph, was a portrait painter. Albert Schweitzer, the humanitarian and medical doctor, was a world-class organist and Bach expert. Root-Bernstein and his wife Michelle co-authored the book *Sparks of Genius*, which examines the minds of inventive people and shows that creativity is something that both artists and scientists can learn. More important, the authors show that the seemingly disparate disciplines of art and science, music and math complement and enhance one another (p. 34-35).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** The assumption is that students can become proficient in the arts just as they can become proficient in other disciplines, thus enhancing their life-long skills and creative ability (p. 14).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2007** The National Council of Teachers of English Elementary Section Steering Committee (1996) states: We define the language arts broadly to include all of the various ways that learners make and share meaning ... (including) art, music, drama, mathematics, and movement as well as the traditional four of language—reading, writing, speaking and listening (p. 33).

(Lynch, P. (2007). Making meaning many ways: An exploratory look at integrating the arts with classroom curriculum. *Art Education*, 60, 4, 33-38.)

**2007** Children who lag behind are being subjected to endless practicing of strategy skills such as “finding the main idea.” Their slow progress induces our schools to add still more time to the literacy block—up to three hours a day in many places—during which time students practice empty exercises on trivial fictions that subtract from time that could be devoted to the substantive knowledge actually needed to gain reading comprehension. (p. 17)

...a central finding about reading comprehension—that *the possession of relevant prior knowledge is the single most potent contributor to the comprehension of a text*. The lack of relevant prior knowledge will hinder comprehension, no matter how many long hours a child has spent learning to monitor, question, or summarize. There is a consensus among comprehension researchers that students with low fluency and self monitoring skills but with relevant prior knowledge will comprehend better than those who have excellent technical reading skills but are weak in relevant knowledge. (p. 19)

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If we want to make sure that students have the background knowledge they need to be good readers, we must give them a good general education—that is, an education in literature, science, history, and the liberal arts. That is the *only* kind of education that can build good readers. Period. Wasting hours on hours of precious school time on trivial, disconnected stories and on futile how-to exercises deprives students of hours that could be spent on learning literature, science, history, and the arts (p. 19-20). (Hirsch Jr., E. D. (2007). What do they know of reading who only reading know? Bringing liberal arts into the wasteland of the “literacy block”. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 17-24). Washington, D.C.: Thomas B. Fordham Institute.)

**2001** As the Teachers College researchers said in their report, studying the arts engages students in a “constellation” of learning that interacts in multiple ways with learning in other school subjects as well as in other dimensions of the students’ emotional and social lives. Learning to act, compose music, or design a building draws on and reinforces habits of mind and personal dispositions at work in other school subjects and social settings. Indeed, these interrelationships are the fundamental premise of formal education: What you learn today will be applied in multiple ways now and in the future (p. 31). (Deasy, R. J. & Fubright, H. M. (2001). The arts’ impact on learning. *Education Week*, 20, 19, 34-35.)

**1998** There is strong theoretical justification for the view that the arts are great potential partners in academic learning, especially when we consider the general role of representation in how we learn and how we express our understandings. Consider a brief story set in a history classroom: an artistic form of representation is proposed by a curriculum pioneer as important to the study of modern European history. Examples of this form are enlisted to present ideas and information to students; learners gather round and discuss what they see in one example to be a rich portrait of Paris in 1898—a city bustling with life and evidence of modernization—the public transit, the electric street lights, the dress, occupations, and pastimes of the Parisians. The students think more deeply about this representation, going over it again and perhaps again for new insights; they discover new questions and possibilities lurking inside and discuss these with their classmates and teacher; there is ambiguity in what they confront. There are messages, some more clear than others. The learners get swept up in the idea that what they see shows marks of the Industrial Revolution they discussed a month ago; they perceive connections to developments in science. They also get playful and compose a fiction—an imagined conversation between a merchant and a well-dressed lady, or between two laborers off to work at the rear of a horse-drawn bus; or they may write the speech of a politician who is concerned about pedestrian safety on the Champs Elysée. They try their own hand at similar representation and find the going rather difficult. Perhaps they even begin to cultivate habits of mind that impact their approaches to other problems or learning situations. ... The students are “reading” the painting, talking about its images discerningly, connecting its messages to themes and historical context explored during their course of study. ... We teach through representations. We construct meaning by formulating our own representations (p. 9-10).



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(Catterall, J. S. (1998). Does experience in the arts boost academic achievement? A response to Eisner. *Art Education*, 6-11.)

## ***Arts Contribute to the Development of the Whole Child***

**2001** Contributors to NAEP's Arts Education framework call the arts—dance included—“essential for every child's complete development and education.” ... Dance belongs in every school's curriculum, the framework writers say, because it allows students to discover insights into themselves and into their social and cultural worlds (p. 30-31). (Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)

**2001** The arts allow students to feel the joy of making thoughts tangible, to fill a space in the world with something they have created (p. 32). (Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)

**1999** More often than we would like, arts educators receive requests to justify our professional existence or the existence of the arts in our schools on the basis of their contributions to non-art outcomes. I cannot recall the number of times I have been asked about the contribution the arts make to increasing tests scores in math, or in reading, or in any other academic subject that the inquirer believes to be more important than any of the arts — or all of them for that matter. What research, callers want to know, demonstrates that experience in the arts boosts academic achievement? They sometimes go on to ask if more exposure to the arts advances school reform. ... I sometimes ask myself if those who inquire ever considered reversing the question. Have they ever thought about asking how reading and math courses contribute to higher performance in the arts (p. 143)? (Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

**1999** We do the arts no service when we try to make their case by touting their contributions to other fields (p. 149). (Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

**1999** This article analyzes the National Educational Longitudinal Survey (NELS:88), a ten-year panel study following more than 25,000 students between the eighth and twelfth grades. Links sustained involvement in theatre arts by low SES youth with improved self-concept and greater motivation, as well as with higher levels of empathy and tolerance for peers. In addition, students consistently involved in instrumental music were shown to have higher levels of mathematics proficiency than their non-music peers, regardless of SES.

(Catterall, J., Chapleau, R. & Iwanaga, J. (1999). Involvement in the arts and human development: General involvement and intensive involvement in music and theatre arts. *Champions of change: The impact of the arts on learning*.

<http://www.gseis.ucla.edu/faculty/publications/100535351554386100.pdf>

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## ***Arts Contribute to Preparation for the Workplace and Society***

**2008** Five years ago, the Los Angeles County Board of Supervisors adopted Arts for All: A Regional Blueprint for Arts Education. The county's hope is that all of its school districts will eventually acknowledge that exposure to and participation in the arts "strengthens a child's academic development and growth as an individual; prepares the child to feel a part of and make a contribution to the community; and ensures a creative and competent workforce to meet the economic opportunities of both the present and the future" (p. 35).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** Robert Redford: "It is crucial that we re-examine how we prepare students to succeed, and indeed thrive, in the workplace and society of the future. We believe that the arts are a key component of meeting this challenge" (p. 28).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** Whether it's an entry point for early childhood education, developing both sides of the brain in grade school or increasing skills taught in high school for a 21<sup>st</sup>-century workplace, the arts provide knowledge and creative abilities that can foster achievement and success in all areas of life (p. 29).

(Rome, N. W. (2008). Collecting arts education data under NCLB. *School Administrator*, 65, 3, p. 29.)

**2008** We don't need the arts in our schools to raise mathematical and verbal skills—we already target these in math and language arts. We need the arts because in addition to introducing students to aesthetic appreciation, they teach other modes of thinking we value. For students living in a rapidly changing world, the arts teach vital modes of seeing, imagining, inventing, and thinking. If our primary demand of students is that they recall established facts, the children we educate today will find themselves ill-equipped to deal with problems like global warming, terrorism, and pandemics. Those who have learned the lessons of the arts, however—how to see new patterns, how to learn from mistakes, and how to envision solutions—are the ones likely to come up with the novel answers needed most for the future (p. 31).

(Winner, E. & Hetland, L. (2008). Art for our sake: School arts classes matter more than ever—but not for the reasons you think. *Arts Education Policy Review*, 109, 5, 29-31.)

**2007** The arts deliver precisely the kinds of thinking and working skills needed in the workplace of the new millennium: analysis, synthesis, evaluation, and critical judgment. The arts nourish imagination and creativity while focusing deliberately on content and end products. The workplace demands collaboration and teamwork, technological competencies, flexible thinking, an appreciation for diversity, and self-discipline—all of

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which are integral to arts learning. Arts-based education also boosts school attendance and communication skills. The arts contribute to lower recidivism rates, increased self-esteem, and the acquisition of job skills, especially for at-risk populations. The arts give students an understanding of the skill, discipline, perseverance, and sacrifice necessary for achievement in the workplace and in personal life (p. 24).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2005** This article presents commentary by Governor Mike Huckabee, who also was Chairman of the Education Commission of the States in 2005, and former U.S. Secretary of Education Rod Paige promoting arts education's influence on the development of critical analysis skills. Introduces "The Arts: A Lifetime of Learning," a program implemented by the Education Commission of the States that aims to use public awareness, research, analytical tools, and leadership efforts to "increase the arts' stature in education."

(Huckabee, M. & Paige, R. (2005). Putting arts education front and center. *Americans for the Arts*. [http://ww3.artsusa.org/services/arts\\_education/arts\\_education\\_012.asp](http://ww3.artsusa.org/services/arts_education/arts_education_012.asp))

**2005** This testimony discusses corporate need for creative individuals, noting that "economic development and success is about competing for talent. People no longer follow jobs—instead they move to the most livable places, and jobs and companies follow them."

(Ohio Senate. (2005). Finance and Financial Institutions Committee. Testimony of Neil Fiske, Chief Executive Officer of Bath and Body Works, Limited, Inc.)

**2005** This article examines the value placed on creativity in the modern economy using statistics from the business sector. Contrasts this demand for innovative employees with the standardization movement in schools, noting that the low priority placed on arts education may hinder America's ability to remain competitive in the global markets of the 21<sup>st</sup> century.

(Robinson, K. (2005). How creativity, education and the arts shape a modern economy. *Education Commission of the States*. <http://www.ecs.org/clearinghouse/60/51/6051.pdf>)

**2005** This book explains that we must learn how to learn, teaching ourselves to stay curious and innovative, if we are to excel in a global economy.

(Friedman, T. L. (2005). *The world is flat: A brief history of the twenty-first century*. New York: Farrar, Straus and Giroux.)

**2004** This article summarizes four studies (Champions of Change: The Impact of the Arts on Learning; Critical Links: Learning in the Arts and Student Academic and Social Development; Creativity, Culture, Education and the Workforce; and The National Assessment of Educational Progress 1997 Arts Report Card). In these studies, arts education is shown to provide positive learning opportunities for at-risk youth, improve the academic and social skills of students, and prepare students for the new "creative workforce."

(Weiss, S. (2004). The arts in education. *The Progress of Education Reform*, 5(1).

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<http://www.ecs.org/clearinghouse/49/91/4991.pdf>

**2002** This article examines the impact of the arts on education, youth at risk, business, tourism, and economic development, noting that participation in the arts leads to the development of skills needed to compete in today's marketplace. Cites America's creative industries, which account for over \$60 billion annually in overseas sales, as its leading export.

(Birch, T.L. (2002). The arts in public policy: An advocacy agenda. *The NASAA Advocate*, 6(1). [http://www.nasaa-arts.org/publications/advocate\\_policy.pdf](http://www.nasaa-arts.org/publications/advocate_policy.pdf))

**2002** This publication examines arts education's role in the development of knowledge-based skills valued in the New Economy. Includes examples of successful arts programs throughout the United States in which participating at-risk and incarcerated youth, as well as youth from the general population, have shown improved skills in communication, personal relationship, problem solving, management and organization. Provides a brief list of strategies and policy options available to governors interested in implementing the arts in their workforce development programs.

(National Governors Association Center for Best Practices. (2002). The impact of arts education on workforce preparation. <http://www.nga.org/cda/files/050102ARTSED.pdf>)

**2001** This book explains why our current education system is narrow, reductive, incomplete, ill-suited to the 21st century, and destroys our natural creative ability.

(Robinson, K. (2001). *Out of our minds: Learning to be creative*. West Sussex, England: Capstone Publishing Ltd.)

**2001** This article suggests that arts education provides students with the traits they need to remain competitive in an economy driven by technological advances and globalization. Examines the growth of the creative industries in the United States, concluding that "the U.S. needs a comprehensive strategy that links education and workforce development at the federal, state, and local levels."

(Galligan, A.M. (2001). Creativity, culture, education, and the workforce. *Center for Arts and Culture*. <http://www.culturalpolicy.org/pdf/education.pdf>)

**2001** This article discusses the need for innovative, team-oriented workers in today's industries. Illustrates the value corporations place on creativity by including highlights from speeches made by CEOs of General Electric, Bravo Networks, Corning Incorporated, and Verizon.

(Franz Peeler, J. & Steuer, G. (2001). The benefits to business of participating in the arts. *Arts & Business Quarterly*. <http://www.artsandbusiness.org/images/Spring%202001.pdf>)

**2000** This article investigates a constellation of complex ways of thinking connected to arts learning and finds that students who have experiences in the arts improve on measures of several dimensions of creativity, including elaborative and creative thinking, fluency, originality, focused perception, imagination, assuming multiple perspectives, and understanding.

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(Abeles, H., Burton, J.M. & Horowitz, R. (2000). Learning in and through the arts: The question of transfer. *Studies in Art Education*, 41(3), 228-257.)

**2000** This study details the finding that, based on data from pre- and post-administrations of the Torrance Test of Creative Thinking, a group of students receiving a systematic instructional program in the arts made greater gains than either of two control groups on several dimensions, including total creativity, fluency, and originality. The author concludes that “there was a strong indication that creative thinking...was facilitated by involvement in the arts.”

(Luftig, R.L. (2000). An investigation of an arts infusion program on creative thinking and academic achievement of children at three grade levels. *Studies in Art Education*.)

**1999** This monograph discusses the function of arts education in preparing students for today’s “economy of ideas” and presents potential methods for building support for arts education. Describes successful models in Florida, New York, Minnesota, and Oklahoma in which the arts were promoted as an integral part of the core curriculum.

(Davidson, B., ed. (1999). Allies, arguments, and actions: Making a case for arts education advocacy. *Americans for the Arts Monographs*.

<http://pubs.artsusa.org/library/ARTS049/html/1.html#pagetop>)

**1995** This publication details a variety of national programs in which arts education was shown to have a positive impact on student achievement. Stresses the growing importance of communication and problem-solving skills in the modern workplace. References the Secretary’s Commission on Achieving Necessary Skills (SCANS), a study in which arts education was shown to nurture “foundation” skills such as “thinking creatively, problem-solving, exercising individual responsibility, sociability and self-esteem.”

(Murfee, E. (1995). Eloquent evidence: Arts at the core of learning.

<http://www.nasaa-arts.org/publications/eloquent.pdf>)

## **Arts Contribute to Self-Discovery and Lead to Positive Societal Outcomes**

**2008** Five years ago, the Los Angeles County Board of Supervisors adopted Arts for All: A Regional Blueprint for Arts Education. The county’s hope is that all of its school districts will eventually acknowledge that exposure to and participation in the arts “strengthens a child’s academic development and growth as an individual; prepares the child to feel a part of and make a contribution to the community; and ensures a creative and competent workforce to meet the economic opportunities of both the present and the future” (p. 35).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2007** Take a 15-year-old who is awkward, who does not feel that she fits into any

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social class in school. This teenager is probably not terribly interested in her schoolwork. Moreover, she feels cut off from her family. But then she auditions for a play. She discovers that there is a group of other kids just like her—alienated youth that feel that they don't belong. These “outsiders” are called theater people, creative people. Once in such a group, that 15-year-old realizes that she isn't abnormal. She is recognized for her acting, she gets applause for doing something that is very closely aligned with these inchoate, inarticulate desires of selfhood, of the self-articulation inside of her.

My high school had the best band in Southern California. Most of the first chair musicians in our band were unruly or rebellious kids. Had they not learned trumpet or drums at an early age, who knows what destructive force they may have unleashed on society? The band gave these kids a way of socializing, a way of directing their energy and everything else that was positive.

The same thing applies to school newspapers, drama clubs, choruses, and other arts groups. When you cut these activities out of school, which the local school boards and state school boards have systematically done in the United States over the past 30 years, you shut the doors of self-realization to a generation of Americans. Those doors once invited students to discover what they are actually good at. They provided positive means of socialization instead of negative forms of self-socialization (or no socialization). They developed and refined young people's productive skills. So the benefits were not only individual or social, but also economic (p. 15). (Gioia, D. (2007). Pleasure, beauty, and wonder: The role of the arts in liberal education. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 11-16). Washington, D.C.: Thomas B. Fordham Institute.)

**2007** I would like to see an American education system that uses the power of the arts to open doors that allow kids develop their own talents. I would like to see a system that uses the arts to take the class clown and, at least for one or two moments a day, lets him become the class star. The arts are one of the ways that we can do this. We need a system that grounds all students in pleasure, beauty, and wonder. It is the best way to create citizens who are awakened not only to their own humanity but also to many possibilities of the human world they are about to enter (p. 16). (Gioia, D. (2007). Pleasure, beauty, and wonder: The role of the arts in liberal education. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 11-16). Washington, D.C.: Thomas B. Fordham Institute.)

**2004** The two most important reasons for studying the arts are to enable our children to be able to appreciate some of the greatest feats humans have ever achieved (e.g., a Rembrandt painting, a Shakespeare play, a dance choreographed by Martha Graham, a Charlie Parker jazz improvisation), and to give our children sufficient skill in an art form so that they can express themselves in this art form. The arts are the only arenas in which deep personal meanings can be recognized and expressed, often in nonverbal form. (from the second article on this citation) (p. 158) (Hetland, L. & Winner, E. (2004). Cognitive transfer from arts education to nonarts outcomes: Research evidence and policy implications. In E. W. Eisner & M. D. Day (Ed.), *Handbook of Research and Policy in Art Education*, pp. 135-161. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.)

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**2001** NDA leaders say ... Instead of a “mere nodding acquaintance with the arts, ... schools should give students a pathway of engagement that leads, in turn, to a lifetime of involvement with the arts. Dance, along with visual arts, music, and drama, can help students discover who they are—and, even more, who they can become” (p. 31). (Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)

**2001** Contributors to NAEP’s Arts Education framework call the arts—dance included—”essential for every child’s complete development and education.” Dance belongs in every school’s curriculum, the framework writers say, because it allows students to discover insights into themselves and into their social and cultural worlds (p. 30-31). (Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)

## **Arts Elevate Learning**

**2008** Lack of financial resources is usually blamed first, but the major factor is the lack of clear understanding of the nature of the learning that occurs in the arts and the power and relevance of that learning in addressing our personal, societal, cultural and economic needs. None of those needs will be fully met — and certainly we will not empower every young person with 21<sup>st</sup>-century skills — until and unless the arts are fully and robustly present in the curriculum and life of our schools. Polls show the public believes that (p. 17). (Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** It is now time to recognize our future economic power will come from the culture we create, and that will come from what our schools produce. Our success is much less dependent upon the skills our children have than on our children’s ability to see the world through fresh eyes. The future will be shaped by those who see through new eyes and who can imagine new things (p. 38). (Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2008** Math isn’t about mastering rules and memorizing times tables. It is about finding the elegance in a well-stated problem. And science isn’t about learning periodic tables and formulas. It is about exploring the mysteries of the universe. And social studies isn’t about trying to remember when, where and who. It is about better understanding the human condition. And literature is not about probing plot lines or grammatical niceties. It is really about understanding ourselves. Learning must be about elegance, mystery and probing our inner universe. And the best way to approach a lot of this is through the arts (p. 40). (Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

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**2008** The great cellist Pablo Casals once remarked that “each second we live is a new and unique moment in the universe, a moment that never was before and will never be again. And what do we teach our children in school? We teach them that two and two make four and that Paris is the capital of France. We should also teach them what they are.” He reminds us that each child is unique and capable of anything, of becoming another Beethoven, Michelangelo or Shakespeare. That they are all marvels and it is our task to make the world worthy of its children (p. 40).  
(Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2008** “The arts can help us break out of traditional patterns of thinking and adopt fresh approaches to intellectual experiences. ... I believe the arts offer an expanded tool set for learning and understanding that can enhance creative thinking skills.” “... We must possess not only the resources but also the creative flexibility to think differently about the arts” (p. 26).  
(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** In 2000, the Arts Education Partnership, together with the President’s Committee on the Arts and Humanities, published a groundbreaking report called “Champions of Change.” According to the report, research shows that learners can reach higher levels of achievement through their engagement with the arts. In addition, learning in and through the arts can help level the playing field for disadvantaged youth (p. 34).

## Why the Arts Change the Learning Experience

\* THE ARTS REACH STUDENTS WHO ARE NOT OTHERWISE BEING REACHED. Young people who are disengaged from schools and other community institutions are at the greatest risk of failure or harm. The arts provided a reason and sometimes the only reason for being engaged with school or other organizations.

\* THE ARTS REACH STUDENTS IN WAYS THAT THEY ARE NOT OTHERWISE BEING REACHED. Young people who were considered classroom failures, perhaps “acting out” because conventional classroom practices were not engaging them, often became the high achievers in arts learning settings. Success in the arts becomes a bridge to learning and eventual success in other areas of learning.

\* THE ARTS CONNECT STUDENTS TO THEMSELVES AND EACH OTHER. Creating artwork is a personal experience. Students draw upon their personal resources to generate the result. By engaging their whole person, they feel invested in ways that are deeper than “knowing the answer.”

\* THE ARTS TRANSFORM THE ENVIRONMENT FOR LEARNING. When the arts become central to the learning environment, schools and other settings become places of discovery. The very school culture is changed and the conditions for learning improve. Figurative walls between classrooms and



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disciplines are broken down. Teachers are renewed. Even the physical appearance of a school building is transformed through the representations of learning.

\* THE ARTS PROVIDE LEARNING OPPORTUNITIES FOR THE ADULTS IN THE LIVES OF YOUNG PEOPLE. Those held responsible for the development of children and youth — teachers, parents and other adults — are rarely given sufficient or significant opportunities for their own continuing education. With adults participating in lifelong learning, young people gain an understanding that learning in any field is a never-ending process. The roles of the adults are also changed. In effective programs, the adults become coaches or active facilitators of learning.

\* THE ARTS PROVIDE NEW CHALLENGES FOR THOSE STUDENTS ALREADY CONSIDERED SUCCESSFUL. Boredom and complacency are barriers to success. For those young people who outgrow their established learning environments, the arts can offer a chance for unlimited challenge. In some situations, older students may teach and mentor younger students. In others, young people gain from the experience of working with professional artists.

\* THE ARTS CONNECT LEARNING EXPERIENCES TO THE WORLD OF REAL WORK. The world of adult work has changed, and the arts learning experiences described in the research show remarkable consistency with the evolving workplace. Ideas are what matter, and the ability to generate ideas, to bring ideas to life and to communicate them is what matters to workplace success. Working in a classroom or a studio as an artist, the young person is learning and practicing future workplace behaviors (p. 35).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** Research in arts education has consistently shown that the arts are a distinct form of knowledge requiring sustained and demanding work and yielding kinds of empathy, understanding and skill both equal and distinctive from those available in [other subject disciplines]. Quality arts education produces positive impacts in terms of ‘improved student attitudes to school and learning, enhanced cultural identity and sense of personal satisfaction and well-being’... “The arts are particularly important for experiencing the joy of creating, developing attention to detail, and learning ways of expressing thoughts, knowledge and feelings beyond words” (p. 105).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** According to Arnold Aprill, “An arts-rich curriculum can help transform a school into a dynamic learning community in which educators and students are more likely to think critically, express themselves creatively, and respect diverse opinions” (p. 110).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** Teachers should move from the role of dispensers of knowledge into the role of facilitators of learning. Students are not merely receivers of the given information, they should be encouraged to construct meaning for themselves. The arts provide students

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with the tools for this construction of knowledge. The arts encourage students to apply their arts-related intelligences to perceive and organize new information into concepts that are used to construct meaning (p. 24).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** I think to myself: One of these days—after I come up with a clear and unambiguous definition for what a dance-arts education is—I’m going to figure out a way to explain its educational benefits clearly and unambiguously. I’ll be able to tell each and every one of you what, if anything, a dance-arts education is and what it does. I’ll be able to tell you so succinctly that you’ll breath in deeply, look profoundly embarrassed that you hadn’t thought of this yourself, sigh a little sigh, and say without reservation, “Oh, now I get it!” I won’t have to convince you to consider dance and its place in education because Suzie reads better, or adds better, or writes better. After I finish explaining my point of view, you will be convinced that Suzie is educationally better off because she has had the chance to dance and to learn to use her corporeal self expressively and creatively. Suzie will be a better Suzie because she can manage her corporeal self with great skill and sensitivity. Suzie will be a better Suzie because she likes her corporeal self more for having had what Margaret H’Doubler termed Suzie’s “subjective-objective” dance experience. Having been both “knowing-subject” and “object-known” in creative-movement terms, Suzie will be aware of her body and its potential in expressivity and in her daily life. Out of her dance experience Suzie will glean many things. If only I could figure out what they are and how to measure them (p. 27-28)!

(Hagood, T. K. (2008). Dance to read or dance to dance? *Art Education Policy Review*, 102, 5, 27-29.)

**2007** Education, true education, should liberate; it should cultivate the genuinely free man, the man of moral judgment, of intellectual integrity; it should give us the power to see the other side; it should impart nobility of purpose and kindness of spirit. It should leave with us the inescapable truth that man is a spiritual being and that that the struggle for the mastery of the forces of nature is not merely for the satisfaction of human needs but is also inspired by the spiritual and of reaching out beyond our immediate lives to something eternal (p. 4).

(Finn, C. E. & Ravitch, D. (2007). Why liberal learning. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 1-10). Washington, D.C.: Thomas B. Fordham Institute.)

**2007** The purpose of arts education is not—as many people assume, including many academics—to create professional artists. This is a narrow view. We do not study poetry to become poets. Nor do we study music to become musicians, or theater to become actors. That sometimes happens, but it is a by-product of arts education and not its main goal. The real purpose of arts education is to awaken us to the full potential of our humanity both as individuals and citizens in society (p. 12).

(Gioia, D. (2007). Pleasure, beauty, and wonder: The role of the arts in liberal education. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 11-16). Washington, D.C.: Thomas B. Fordham Institute.)

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**2007** Rodney Van Valkenburg, Director of Arts Education, Allied Arts of Greater Chattanooga, believes that the reason the arts work is that “the skills necessary to be a good artist are the same skills that are needed to be a good student: self-control of your body, voice, and mind” (p. 15).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2003** The arts are among the most powerful learning experiences your students can have and, with the right kind of planning, they will enrich the overall performance of your entire school (p. 18).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

## Arts Shape Our World

**2008** Beyond the school walls the arts are not only richly integrated into the world of today and tomorrow, they are major forces shaping those worlds through communications, design, entertainment and culture. We and our students are challenged to master and respond to these forces. By keeping learning in the arts at the margins of public education, we are condemning ourselves and our students to be marginalized in the world (p. 17).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** [Pink] suggests if your job can be done elsewhere cheaper or by a machine (computers are great at linear, sequential acts), then you are in trouble. But if your work involves creative, innovative thinking such as story telling, design or empathy, then you are in good shape because your job can't easily be outsourced. He suggests we are moving into a conceptual world where these creative skills are most important.

The last century was called by many the “American Century” because of our domination in military and economic terms. But as author Ben Wattenberg described it in *The First Universal Nation*, our domination and the making of the first universal nation may well have had more to do with our popular culture than anything else. He pointed out it wasn't the electronic boxes that were being produced in the Far East that were important, it was the software, the movies and the music that went into them that created culture.

... The universal images the world watches and the sounds they listen to most often emanate from American shores. Yes, in World War II our military might have liberated Paris, but it may be Paris Hilton who is winning the current war for world influence. For better or worse, American popular culture trumps all others.

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America's real power is not in our engineering but in our "imagineering" ... (p. 38).  
(Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2008** The true impact of the arts far exceeds our ability to put a dollar amount on it. Throughout history, the arts have built the infrastructure from which human knowledge and cultural values have been forged. However, in a century characterized by the growing dominance of the knowledge-based economy, ensuring that our children master the creative skills and habits of mind that fuel our knowledge is a capital investment we cannot afford to miss (p. 30).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2001** Let's bet on history. Of course, we do not know for sure what is the best education for children to ensure that they will grow up to lead productive and happy lives. But the arts have been around longer than the sciences; cultures are judged on the basis of their arts; and most cultures and most historical eras have not doubted the importance of studying the arts. Let's assume, then, that the arts should be a part of every child's education and treat the arts as seriously as we treat mathematics or reading or history or biology. Let's remember why societies have always included the arts in every child's education. The reason is simple. The arts are a fundamentally important part of culture, and an education without them is an impoverished education leading to an impoverished society. Studying the arts should not have to be justified in terms of anything else. The arts are as important as the sciences: they are time-honored ways of learning, knowing, and expressing (p. 5).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5, 3-6.)

## ***Focus on Testing Inaccurately Portrays Student Achievement and Stifles Creativity***

**2008** In a piece written for Newsweek magazine, Fareed Zakaria interviewed the minister of education of Singapore. Zakaria pointed out that while the students in Singapore outperform the students in the United States on tests, years later the American students are much more successful in the world of work, particularly as inventors and entrepreneurs. The minister explained that both countries have meritocracies — in Singapore, it is based on testing and in the United States, it is based on talent. He conceded what behaviors make a student successful — creativity, curiosity and a sense of adventure — are not covered on tests. This is where America has an edge. The minister went on to mention that Singapore must learn from America's culture of learning, which challenges conventional wisdom, even to the point of challenging authority.

While Singapore is trying to copy what we do best, we are trying to copy Singapore in the one place that will not give us an economic edge — the culture of testing. Where we

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might want to copy Singapore is in their treatment of teachers. In Singapore, beginning teachers make more than beginning doctors, lawyers and engineers. When I questioned this on a visit there, I was reminded you would not have doctors, lawyers or engineers without teachers. And yet, any chance we might have to compete internationally in education hinges on our teachers' ability to educate our children effectively and creatively. ...

The greatest irony is that at a time when America needs its creativity and ingenuity the most to compete with the enormous scale of our competitors, we have chosen to, as "A Nation at Risk" warned us against 2.5 years ago, unilaterally disarm ourselves. We are reshaping our educational system to look more like Singapore, with more emphasis on a culture of testing and less on a culture of culture. The very things that make America uniquely American — our innovative spirit and our creative expression — are being pushed out of our schools in favor of a narrowed curriculum built around norm-referenced, high-stakes tests. Schools now are rewarded and mostly punished for their performance on multiple-choice tests, the least creative and innovative activities found in schools (p. 39). ...

Cognitive scientists remind us that fear inhibits cognitive processes, and yet we are trying to make children and schools smarter by threatening them and scaring them to death. ...

There is no question that a significant portion of America's children are not performing to world-class standards. This is mostly because America is not performing to world-class standards in dealing with the social issues that plague many children and their families (p. 40).

(Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2008** The poor children in America bring many assets to school with them every day. And these assets are often in areas that would bring greater success to America in the global marketplace. If you look at one of the creative cultural gifts America has given the world, such as music, you would identify genres such as jazz, blues, bluegrass, country, rock, R&B and hip-hop.

What do all these forms have in common? They all came from a part of our society that had been left behind. The children on the Native American reservations in the Southwest may not perform at grade level, but if they are tasked with assignments to "design" (one of Pink's basic skills in the conceptual world) they are highly proficient. Basketball players in the ghettos of our inner cities might not know what the concept of systems thinking is, but if put on a basketball court they know where 10 people are moving through time and space and can anticipate their movements and create elegant responses to them — the essence of a systems thinking approach.

Classrooms full of immigrant children might have trouble meeting the goal of adequate yearly progress set by No Child Left Behind, but those same children culture shift and

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language shift multiple times during the day -something most middle-class Americans cannot do in this increasingly diverse global world.

Creativity is often found at the margins of a society, where ideas and imaginations are free to roam. We need to spend less time on identifying what children do not know and more time celebrating what they do know. We need to find ways to build upon these strengths to help them learn what else they may need to be successful in their own lives and productive citizens for the world (p. 40).

(Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2007** If public education is truly committed to having no child left behind, it would do well to consider bringing the arts along, too (p. 38).

(Lynch, P. (2007). Making meaning many ways: An exploratory look at integrating the arts with classroom curriculum. *Art Education*, 60, 4, 33-38.)

**2007** Today there are two closely related visions of American education in practice. One aims to produce children who pass standardized testing at each level. The other is one that produces entry-level workers for a consumer society. Both targets might be interesting as tactics, but neither are inspiring objectives for education. These are very small aims—far too small to guide and inspire an adequate educational system. Let me offer an alternative vision. The purpose of education in the United States should be to create productive citizens for a free society. ... Those words and ideas are worth examining. The first term is “productive.” We are now in the twenty-first century. The twentieth century was the American century during which the U.S. was preeminent in terms of productivity, innovation, wealth, and power. The world is a much more complicated place today. The United States is not going to compete with the rest of the world in terms of cheap labor or cheap raw materials. If we are going to compete productively with the rest of the world, it’s going to be in terms of creativity and innovation. America has always had a capacity for hard work and stamina, but those qualities of creativity and ingenuity are not being nurtured and fostered by our current educational system (p. 11-12).

(Gioia, D. (2007). Pleasure, beauty, and wonder: The role of the arts in liberal education. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 11-16). Washington, D.C.: Thomas B. Fordham Institute.)

**2007** There is no way we can train people to be productive citizens in a complex, free society if all we do is prepare them to pass standardized tests. I’m not an enemy of these tests, because if people can’t read, if they can’t add and subtract, they can’t do much else. But literacy and mathematics are only the foundation of a building. We need to add the walls and the upper stories. One of the best ways to accomplish this task is through teaching the liberal arts, and in particular, the fine arts (p. 12).

(Gioia, D. (2007). Pleasure, beauty, and wonder: The role of the arts in liberal education. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 11-16). Washington, D.C.: Thomas B. Fordham Institute.)

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## *Imagination, Creativity, and Innovation*

**2009** This book tackles the challenge of determining and pursuing work that is aligned with individual talents and passions to achieve well-being and success. “The element” is the point where the activities individuals enjoy and are naturally good at come together. Robinson emphasizes the importance of nurturing talent and honing creativity, talks about how mentors are crucial, and discusses the need to transform education. (Robinson, K. (2009.) *The Element: How Finding Your Passion Changes Everything*. New York: Viking.)

**2008** Imagination, innovation and creativity have been the foundation that catapulted the United States into a world leadership role, not only in the realm of economics, but by offering the world a unique model of democracy, one capable at its best of embracing a diversity of peoples in forging a vibrant society. Our leadership is threatened to the extent we do not revitalize and sustain these capacities in ourselves and in the students we teach. ... the “new basics” that schools must nurture: imagination and its application in being innovative and creative (p. 13). (Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** These capacities demanded by the arts are the same skills that business and corporate leaders tell us are essential for American success in the global economy. ...in a poll for the Partnership for 21st Century Skills, the public ranked ethics and social responsibility, teamwork and collaboration, lifelong learning and self-direction along with imagination, innovation and creativity as skills they want schools to do a better job of teaching. They ranked these values and abilities as more important than individual school subjects, including science and mathematics.

The Arts Education Partnership, a national nonprofit coalition of more than 100 education, arts, government and philanthropic organizations, found a similar set of concerns in focus groups and in a national independent poll commissioned on behalf of its coalition. Imagination, focus group participants said, allowed young people to have dreams and aspirations for their future, to have a vision of what they could become and accomplish. These hopes and goals motivate them to learn. They are a reason to stay in school and are the basis for developing the skills and values needed to succeed. Without them, both students and schools will fail.

“I’m angry about schools,” one frustrated urban parent said to murmurs of support from others in a focus group. “Schools are stifling imagination and creativity. I’m doing more at home than the schools are.”

“Schools are about making sure everybody’s average,” said another. “All that rote stuff to pass tests. America can’t afford that. We’ve got to go way beyond average.” . . .

. . . On the national poll commissioned by the Arts Education Partnership, 80 percent of the respondents said it was important or extremely important for schools to develop the imagination and innovative and creative skills of students. And 88 percent said the arts

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were essential for doing so and were a sound educational investment. On each of the cognitive capacities developed by the arts discussed above, an average of 80 percent of respondents felt they were important to be taught in schools and 79 percent felt schools were not doing so. (Full findings at [www.theimagination.net](http://www.theimagination.net).)

It's clear the public believes the arts play a crucial and catalytic role in developing the imagination, but all teaching should foster imaginative thinking. Multiple forms of the arts give students a chance to reveal their individuality, their knowledge, their competence, their feelings and beliefs, their potential. These revelations in the works they produce give teachers insights and understanding to inform their teaching, to better foster the full exercise of students' imagination and creativity, and to give every student confirmation their aspirations are achievable. Those attitudes can bring about a transformation in the entire school (p. 15-16).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** As schools cut time for the arts, they may be cutting just the curriculum that would build the innovative leaders of tomorrow.

The profile of skills required in the 21st century labor force has changed. No longer do memorized facts and rigid formulas pave the way to lucrative careers. Instead, non-routine thinking is the basic skill for job categories that economists predict will increase, while those jobs that require formulaic decisions diminish, either because of outsourcing or automation (p. 14).

(Hetland, L. (2008). Basically, arts are basic. *School Administrator*, 65, 3, 14-15.)

**2008** [Pink] suggests if your job can be done elsewhere cheaper or by a machine (computers are great at linear, sequential acts), then you are in trouble. But if your work involves creative, innovative thinking such as storytelling, design or empathy, then you are in good shape because your job can't easily be outsourced. He suggests we are moving into a conceptual world where these creative skills are most important. ...

The last century was called by many the "American Century" because of our domination in military and economic terms. But as author Ben Wattenberg described it in *The First Universal Nation*, our domination and the making of the first universal nation may well have had more to do with our popular culture than anything else. He pointed out it wasn't the electronic boxes that were being produced in the Far East that were important, it was the software, the movies and the music that went into them that created culture. ...

The universal images the world watches and the sounds they listen to most often emanate from American shores. Yes, in World War II our military might have liberated Paris, but it may be Paris Hilton who is winning the current war for world influence. For better or worse, American popular culture trumps all others.



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America's real power is not in our engineering but in our "imagineering" ... (p. 38).  
(Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2008** As a special report in Business Week magazine observed last year: "The game is changing. It isn't just about math and science anymore. It's about creativity, imagination, and, above all, innovation." Most analysts studying the new global economy agree that the growing "creative and innovative" economy represents America's salvation. But how do we make someone innovative and creative? ...Former U.S. Secretary of Education Richard Riley predicted the jobs in greatest demand in the future don't yet exist. In fact, he said, they will require workers to use technologies that have not yet been invented to solve problems that we don't yet even know are problems (p. 32).  
(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** ... Dana Gioia, chairman of the National Endowments for the Arts, said, "If the U.S. is to compete effectively with the rest of the world in the new global marketplace, we need a system that grounds all students in pleasure, beauty and wonder. It is the best way to create citizens who are awakened not only to their humanity, but to the human enterprise that they inherit and will — for good or ill — perpetuate."

He argued that America's success will not be through "cheap labor, cheap raw materials, or the free flow of capital or a streamlined industrial base," but through "creativity, ingenuity, innovation."

Gioia's formula for success is simple enough: Nurture a love of reading and marvel at the beauty of a sunset or a tree in bloom; find wonder in the mystery of birth, prehistoric life or the DNA of life itself; and ensure the arts play a central role in our lives (p. 32-33).  
(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** ... Sir Ken Robinson, an international expert in the field of creativity and innovation in education, who said, "Creativity is as important as literacy and should be given equal status" (p. 35).  
(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** As schools cut time for the arts, they may be losing their ability to produce not just the artistic creators of the future, but innovative leaders who improve the world they inherit (p. 29).  
(Winner, E. & Hetland, L. (2008). Art for our sake: School arts classes matter more than ever—but not for the reasons you think. *Arts Education Policy Review*, 109, 5, 29-31.)

**2007** In the long run, America's true competitive edge is not its technical prowess but its creativity, its imagination, its inventiveness, its people's capacity to devise new solutions, to innovate, to invest new organizational as well as technological forms, and to eke

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productivity gains out of what others see as static situations (p. 7).

(Finn, C. E. & Ravitch, D. (2007). Why liberal learning. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 1-10). Washington, D.C.: Thomas B. Fordham Institute.)

**2007** Today there are two closely related visions of American education in practice. One aims to produce children who pass standardized testing at each level. The other is one that produces entry-level workers for a consumer society. Both targets might be interesting as tactics, but neither are inspiring objectives for education. These are very small aims—far too small to guide and inspire an adequate educational system. Let me offer an alternative vision. The purpose of education in the United States should be to create productive citizens for a free society. ... Those words and ideas are worth examining. The first term is “productive.” We are now in the twenty-first century. The twentieth century was the American century during which the U.S. was preeminent in terms of productivity, innovation, wealth, and power. The world is a much more complicated place today. The United States is not going to compete with the rest of the world in terms of cheap labor or cheap raw materials. If we are going to compete productively with the rest of the world, it’s going to be in terms of creativity and innovation. America has always had a capacity for hard work and stamina, but those qualities of creativity and ingenuity are not being nurtured and fostered by our current educational system (p. 11-12).

(Gioia, D. (2007). Pleasure, beauty, and wonder: The role of the arts in liberal education. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 11-16). Washington, D.C.: Thomas B. Fordham Institute.)

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## Arts for the Arts' Sake

**2008** ... justifying “the arts on the basis of their impact on academic performance is not uncontroversial.” Those who make this argument are in danger of conceding that other subjects are academically superior, which leads to the undermining of the arts in education (p. 104).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** We don't need the arts in our schools to raise mathematical and verbal skills—we already target these in math and language arts. We need the arts because in addition to introducing students to aesthetic appreciation, they teach other modes of thinking we value. For students living in a rapidly changing world, the arts teach vital modes of seeing, imagining, inventing, and thinking. If our primary demand of students is that they recall established facts, the children we educate today will find themselves ill-equipped to deal with problems like global warming, terrorism, and pandemics. Those who have learned the lessons of the arts, however—how to see new patterns, how to learn from mistakes, and how to envision solutions—are the ones likely to come up with the novel answers needed most for the future (p. 31).

(Winner, E. & Hetland, L. (2008). Art for our sake: School arts classes matter more than ever—but not for the reasons you think. *Arts Education Policy Review*, 109, 5, 29-31.)

**2005** One frequently stated conclusion is that the lack of evidence of a causal link between the arts and academic achievement should not be used as a reason to stop promoting the arts for their own sake (p. 8).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2001** Harvard University researchers Ellen Winner and Lois Hetland, co-investigators for a project called Reviewing Education and the Arts, have an answer: The “arts must be justified in terms of what the arts can teach that no other subject can teach” (p. 32).

(Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)

**2001** Arts educators have tried to strengthen the position of the arts in our schools by arguing that the arts can be used to buttress the 3Rs. ... There is danger in such reasoning. If the arts are given a role in our schools because people believe the arts cause academic improvement, then the arts will quickly lose their position if academic improvement does not result, or if the arts are shown to be less effective than the 3Rs in promoting literacy and numeracy. Instrumental claims for the arts are a double-edged sword. It is implausible to suppose that the arts can be as effective a means of teaching an academic subject as is direct teaching of that subject. And thus, when we justify the arts by their secondary, utilitarian value, the arts may prove to have fewer payoffs than academics. Arts educators should never allow the arts to be justified wholly or even primarily in terms of what the arts can do for mathematics or reading. The arts must be

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justified in terms of what the arts can teach that no other subject can teach. (p. 3)  
(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

**2001** These mixed findings should make it clear that, even in cases where arts programs add value to non-arts academic outcomes, it is dangerous to justify arts education by secondary, non-arts effects. Doing so puts the arts in a weakened and vulnerable position. Arts educators must build justifications based on what is inherently valuable about the arts themselves, even when the arts contribute secondary benefits. Just as we do not (and could not) justify the teaching of history for its power to transfer to mathematics, we must not allow policy makers to justify (or reject) the arts based on their alleged power to transfer to academic subject matters (p. 5).  
(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

**2001** The arts offer a way of thinking unavailable in other disciplines. The same might be said of athletics. Suppose coaches began to claim that playing baseball increased students' mathematical ability because of the complex score keeping involved. Then suppose re-searchers set out to test this and found that the claim did not hold up. Would school boards react by cutting the budget for baseball? Of course not. Because whatever positive academic side effects baseball might or might not have, schools believe sports are inherently good for kids. We should make the same argument for the arts: the arts are good for our children, irrespective of any non-arts benefits that the arts may in some cases have (p. 5).  
(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

**2001** If we required physical education to demonstrate transfer to science, the results might be no better, and probably would be worse. So, it is notable that the arts can demonstrate any transfer at all (p. 5).  
(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

**2000** The arts are important in their own right and should be justified in terms of the important and unique kinds of learning that arise from the study of the arts. We should not expect more, in terms of transfer, from the arts than we expect from other disciplines. We do not justify the presence of mathematics education by whether such study leads to stronger skills in English or Latin; nor should we justify the presence of arts education by whether such study leads to stronger skills in traditional academic areas (p. 7).  
(Winner, E. & Hetland, L. (2000). The arts in education: Evaluating the evidence for a causal link. *Journal of Aesthetic Education*, 34, 3-4. 3-10.)

**1999** Problems begin to emerge when the values for which the arts are prized in schools are located primarily in someone's version of the basics, when those basics have little or nothing to do with the arts. ... The core problem with such rationales for arts education is that they leave the arts vulnerable to any other field or educational practice that claims

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that it can achieve the same aims faster and better (p. 146). ... My claim, at base, is that arts education and the several art fields that constitute it ought to give pride of place to those unique contributions that only the arts make possible (p. 147) ... the contributions arts education makes to both the arts and to life beyond them (p. 148):

1. *Students should acquire a feel for what it means to transform their ideas, images, and feelings into an art form.* ... getting a feel for the process through which works of art come into being is fostered best by having experience trying to do so yourself, even if the most telling outcome of such experience is to recognize how much distance exists between our best efforts and the work of masters. (p. 148)

2. *Arts education should refine the student's awareness of the aesthetic qualities in art and life.* If arts education is about anything, it is about helping students become alive to aesthetic qualities of art and life in the worlds in which they live. Put more directly, arts education should help students learn to use an aesthetic frame of reference to see and hear. What does this mean educationally? It means that students will know what they can listen for in music and what they can look for in the visual arts. It means also that when they are asked about the works or situations they encounter they will be able to say something about them with insight, sensitivity, and intelligence. It means that they will know not only what they like or respond to in a work — or a walk, for that matter — but why. This means that they will have reasons for their preferences, they will be able to bring to a work what they need to render the work intelligible.

3. *Arts education should enable students to understand that there is a connection between the content and form that the arts display and the culture and time in which the work was created.* This outcome is intended to situate the arts within culture and to advance students' understanding that the problems that artists tackle and how they do so are influenced by the setting in which they work. ... the quality of experience the arts make possible is enriched when the arts are experienced within a context of ideas relevant to them. Understanding the cultural context is among the most important ways in which such enrichment can be achieved ... the idea of the relationship of culture and art at the level of principled generalization should be understood and that at least one or more examples of that idea should be part of the student's intellectual repertoire.

4. Finally, I wish to identify a particularly important set of outcomes for arts education.

\* *A willingness to imagine possibilities that are not now, but which might become.*

\* *A desire to explore ambiguity, to be willing to forestall premature closure in pursuing resolutions.*

\* *The ability to recognize and accept the multiple perspectives and resolutions that work in the arts celebrate (p. 148).*

(Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

**1999** More often than we would like, arts educators receive requests to justify our professional existence or the existence of the arts in our schools on the basis of their contributions to non-art outcomes. I cannot recall the number of times I have been asked about the contribution the arts make to increasing tests scores in math, or in reading, or in any other academic subject that the inquirer believes to be more important than any of the arts — or all of them for that matter. What research, callers want to know, demonstrates

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that experience in the arts boosts academic achievement? They sometimes go on to ask if more exposure to the arts advances school reform. ... I sometimes ask myself if those who inquire ever considered reversing the question. Have they ever thought about asking how reading and math courses contribute to higher performance in the arts (p. 143)? (Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

**1999** We do the arts no service when we try to make their case by touting their contributions to other fields (p. 149).  
(Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

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## Arts Outcomes

**2008** The findings suggest that narrative inquiry is an appropriate method to situate the individual as central to the research and allow participants' definitional perspective of art and impact to be recorded. ... A key finding was that the participants experienced art in widely different ways and placed varying degrees of significance on the different impacts of their experiences.

...The knowledge gained from the narrative inquiry demonstrates that the impact of art is a complex and multilayered concept that is experienced and understood in a variety of different ways contingent on each individual's experience and perspective. The findings illustrate that the impact of art is not solely limited to social impacts, as previous empirical research emphasizes, but incorporates myriad individual impacts. Further, the findings also illustrate that impact of art does not automatically occur... (p. 32).

(White, R. W. & Hede, A.M. (2008). Using narrative inquiry to explore the impact of art on individuals. *The Journal of Arts Management, Law, and Society*, 38, 1, 19-3\_.)

**2004** One of the key insights from this analysis is that the most important instrumental benefits require sustained involvement in the arts (p. xv).

(McCarthy, K. F., Ondaatje, E. H., & Zakaras, L. (2004). *Gifts of the muse: Reframing the debate about the benefits of the arts*. Santa Monica, CA: RAND Corporation.)

## Abstract Reasoning

**2008** Arts education not only provides artistic training, but teaches children creativity, spatial thinking and abstract reasoning, all critical skill sets for tomorrow's software designers, scientists, entrepreneurs and engineers (p. 27).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** Compilations of more than 60 peer-reviewed independent studies published in recent years by the national Arts Education Partnership have begun to provide research-based answers to these questions. The studies identify the cognitive capacities — habits of mind and personal dispositions — that are developed as students tackle the specific challenges of an art form: the choreography and movements of a dance; the composition and performance of a piece of music; the script and acting of a drama; the design and creation of a painting or sculpture; the writing and performance of an opera. As students learn the content, processes and techniques specific to each of these art forms, they are at the same time developing and applying these capacities.

\* Symbolic understanding. Reading, writing and doing math are processes of grasping and using symbols. So is playing the notes on sheet music, assembling colors and shapes into a portrait. Understanding and using multiple modes to

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represent and communicate ideas and feelings helps us get better at all of them. That's one of the links between the arts and literacy (p. 14-15).  
(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

## Brain Research

**2010** Social emotions like admiration for another person's virtue are often associated with a desire to be virtuous one's self, and to engage in meaningful and socially relevant activities against any odds. These emotions can profoundly inspire us, sometimes motivating our most significant life-course decisions. Yet despite the cognitive maturity and complexity of knowledge required to induce an emotion like admiration for virtue, our recent study of the brain revealed significant involvement of low-level brain systems responsible for the feeling of the gut and the maintenance of basic life regulation. These findings contribute an interesting jumping-off point for reexamining the educational study of motivation states because they suggest that, contrary to current conceptions in educational research, nonconscious, low-level physiological processes related to survival and bodily sensation may be critical contributors to intrinsic motivation.  
(Immordino-Yang, M. H., and Sylvan, L. (2010). Admiration for virtue: Neuroscientific perspectives on a motivating emotion. *Contemporary Educational Psychology*, 35(2), 110-115.)

**2008** In 2004, the Dana Arts and Cognition Consortium brought together cognitive neuroscientists from seven universities across the United States to grapple with the question of why arts training has been associated with higher academic performance. Is it simply that smart people are drawn to "do" art—to study and perform music, dance, drama—or does early arts training cause changes in the brain that enhance other important aspects of cognition? ... Here is a summary of what the group has learned:

1. An interest in a performing art leads to a high state of *motivation* that produces the *sustained attention* necessary to improve performance and the training of attention that leads to improvement in other domains of cognition.
2. Genetic studies have begun to yield candidate genes that may help explain individual differences in interest in the arts.
3. Specific links exist between high levels of music training and the ability to manipulate information in both working and long-term memory; these links extend beyond the domain of music training.
4. In children, there appear to be specific links between the practice of music and skills in geometrical representation, though not in other forms of numerical representation.
5. Correlations exist between music training and both reading acquisition and sequence learning. One of the central predictors of early literacy, phonological awareness, is correlated with both music training and the development of a specific brain pathway.



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6. Training in acting appears to lead to memory improvement through the learning of general skills for manipulating semantic information.
7. Adult self-reported interest in aesthetics is related to a temperamental factor of openness, which in turn is influenced by dopamine-related genes.
8. Learning to dance by effective observation is closely related to learning by physical practice, both in the level of achievement and in the neural substrates that support the organization of complex actions. Effective observational learning may transfer to other cognitive skills.

Although scientists must constantly warn of the need to distinguish between correlation and causation, it is important to realize that neuroscience often begins with correlations—usually, the discovery that a certain kind of brain activity works in concert with a certain kind of behavior. ... Many of the studies cited here tighten up correlations that have been noted before, thereby laying the groundwork for unearthing true causal explanations through understanding biological and brain mechanisms that may underlie those relationships.

... In my judgment, this project has identified candidate genes involved in the predisposition to the arts and has also shown that cognitive improvements can be to specific mental capacities such as geometric reasoning; that specific pathways in the brain can be identified and potentially changed during training; that sometimes it is not structural brain changes but rather changes in cognitive strategy that help solve a problem; and that early targeted music training may lead to better cognition through an as yet unknown neural mechanism. All of those findings are rather remarkable and challenging.

(Gazzaniga, M. S. (2008). Arts and cognition: Findings hint at relationships. 2008 Progress Report on Brain Research. The Dana Press. 7-12.)

**2007** Arts integration creates a highly stimulating learning environment for all children. Since the brain is constantly changing during childhood, it is important to be responsive to individual maturational strengths and needs as well. Arts integration focuses on the “power of one,” in which each child is valued for his/her uniqueness, while there is sensitivity to general developmental patterns (p. 38).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** The arts are arguably the most important tool a teacher has to engage the emotions. Artists create things to engage others emotionally so art pieces are compelling instructional materials. Creating art is emotionally engaging as well. “The arts, then, change the brain of both the creator, and the consumer.” Arts-based lessons employ emotions to release memory proteins. Students are intentionally engaged in experiences that call for feelings to be felt and expressed. The importance of the arts in school is strongly associated with motivation and interest. Arts-based instruction gives students freedom and ownership that are “part and parcel of the neurochemistry of the arts.” Creating meaning through the arts employs diverse media and alternative sign systems to expand ways to express feelings and ideas. Creativity is based on the decisions made by the creator, which causes the brain’s reward system to kick in. Chemicals, such as dopamine, are released in the region of cortex used to create ideas, problem solve and

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make decisions, and plan actions. Students feel satisfaction and pride when they create original ideas and objects (p. 39-40).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Brain changes are most extensive and powerful when emotion is part of learning. The chemicals of emotion, such as adrenalin, serotonin, and dopamine modify synapses. Modification of synapses is the very root of learning. Connections may not occur at all if the emotion chemicals and structures in the brain are not engaged (p. 39).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** ... every musical [arts] experience that we offer our students affects their brains, bodies, and feelings. In short, it changes their minds permanently (p. 39).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2006** Pink argues that business and everyday life will soon be dominated by right-brain thinkers. He identifies the roots and implications of transitioning from a society dominated by left-brain thinkers into something entirely different. Pink pinpoints abundance, Asia, and automation as the primary forces behind this change. The keys to success are in developing and cultivating six senses: design, story, symphony, empathy, play, and meaning. Pink compares this upcoming "Conceptual Age" to past periods of upheaval, such as the Industrial Revolution and the Renaissance.

(Pink, D.H. (2006.) *A Whole New Mind: Why Right-Brainers Will Rule the Future*. New York: Riverhead.)

**2005** Musical performance demands complex cognitive and motor operations. Musicians must translate music notation (visual-spatial-temporal information) into precisely timed sequential finger movements involving coordination of both hands, recall long passages, bring meaning to music through the use of dynamics and articulation, transpose pieces to new keys, and improvise melodies and harmonies based on existing musical pieces. Some musicians are also able to identify pitches without the use of a reference tone (absolute pitch). Studies have explored the brain bases of these exceptional and highly specialized sensorimotor skills, and auditory-spatial skills. These studies have shown that in musicians certain regions of the brain are larger or have more gray matter volume (when compared to non-musicians)....These differences are even greater among musicians who began musical training at an early age. Similarly, differences between musicians and non-musicians correlate with intensity of musical training throughout life (p. 125).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2005** ...functional brain differences are associated with the particular musical instrument played. Violin training is associated with adaptations in brain regions controlling fine finger movements of the left hand; piano training is associated with adaptations in brain

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regions controlling finger movements of both the hands (p. 125).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2005** First, areas in adult musicians' brains shown to be enlarged are greatest in those musicians who began training at relatively a young age. Second, degree of structural brain differences between musicians and non-musicians correlates with intensity of musical training. Third, functional brain differences between two different types of instrumentalists suggest that differences evolved as a function of playing and training on a specific instrument (p. 130).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2005** Further evidence that music training accounts for the brain differences in adult musicians comes from a study showing electrophysiological effects (enhanced P2) of instrumental music training in 4- to 5-year-olds after 1 year of piano or violin training in response to tones from their instrument, with some specific effects depending on the instrument studied. Skilled violinists and pianists also show an enhanced P2 component while listening to music compared to non-musicians (p. 130).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2002** This book explains the neurodevelopmental research of the author, who has found that students bring unique combinations of strengths and challenges to school. Understanding these differences can help teachers meet students' needs. Often children may be perplexed by what appears to be their failure to fit a "norm." Through a process he calls "demystification," Levine's approach helps individual children to understand that each has a unique set of strengths, as well as areas where they need additional help. (Levine, M. (2002). *A mind at a time*. New York: Simon & Schuster.)

**2000** Knowledge that is taught in multiple contexts is likely to support the transfer of learning from one domain to another. Learning to look for, recognize, and extract underlying themes and ideas can help students to understand when and under what conditions to apply their knowledge, an aspect of expertise.

(Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Research Council.)

**1999** This noted neurologist takes on the question of the origin of consciousness, proposing that the answer lies in emotion. Damasio distinguishes between core consciousness, the nonverbal awareness of one's state of being, and extended consciousness, which entails a sense of other times and places. Damasio argues that most higher organisms possess core consciousness and many possess some form of extended consciousness; but in its highest manifestations, such as art and science, extended

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consciousness is characteristic of humanity. He insists on the role of emotion in creating extended consciousness, which in one sense is core consciousness augmented by memory. At its base, Damasio concludes, consciousness means that we feel both pain and pleasure; in its higher manifestations, it enables us to transcend and articulate these feelings through language, creativity, and conscience.

(Damasio, A. (1999.) [\*The Feeling of What Happens: Body and Emotion in the Making of Consciousness\*](#). Boston: Harcourt.)

**1994** Neuropsychology experts Geoffrey and Renate Caine examine how the brain functions during learning experiences and how this knowledge can influence teaching strategies. The brain has an infinite number of possibilities for making connections and constantly seeks meaning by identifying patterns, according to the authors.

(Caine, R.N. & Caine, G. (1994) *Making connections: Teaching and the human brain*. Menlo Park, CA: Innovative Learning Publications.)

## Collaboration

**2008** The arts are an integral part of our learning and growing process. Through the arts we learn about other people and cultures. We learn to look at themes, ideas and perspectives in new and different ways. We also learn to work with others, for collaboration is often one of the distinguishing characteristics of working in the arts (p. 50).

(Jerome, S. (2008). Bringing the arts front and center. *School Administrator*, 65, 3, 50.)

**2008** ... arts programs can enhance students' potential to engage with school and learning. The following 'enabling' skills and attitudes were noted: students' self esteem was increased; students were better able to work cooperatively with others; and students were able to plan and set goals (p. 107).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** The arts also were viewed as instrumental in enhancing student communication while increasing student ability to interact and to reflect (p. 16-17).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Compilations of more than 60 peer-reviewed independent studies published in recent years by the national Arts Education Partnership have begun to provide research-based answers to these questions. The studies identify the cognitive capacities — habits of mind and personal dispositions — that are developed as students tackle the specific challenges of an art form: the choreography and movements of a dance; the composition and performance of a piece of music; the script and acting of a drama; the design and creation of a painting or sculpture; the writing and performance of an opera. As students

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learn the content, processes and techniques specific to each of these art forms, they are at the same time developing and applying these capacities.

\* Collaborative learning and action. Rehearsing and putting on a play, practicing and performing in a chorus and dancing in a musical are collaborative processes of acquiring and manifesting knowledge and skills. You are committed to pursuing a common goal and working toward it. It's teamwork (p. 14-15).  
(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** The research, reported in "Studio Thinking: The Real Benefits of Visual Arts Education" by this author, shows that arts help students find important problems and persist toward their solutions. Arts teach envisioning, observing, informed risk-taking, learning from mistakes and comfort with uncertainty. They emphasize collaboration, expression, reflection and articulation of deeply held ideas (p. 14).  
(Hetland, L. (2008). Basically, arts are basic. *School Administrator*, 65, 3, 14-15.)

**2007** The arts build cooperation by involving students in group problem solving through ensembles, choirs, troupes, and skits. Through arts experiences, they learn to work as a team, to respect diverse points of view, and to see that relationships among people and ideas matter. These ways of working are critical to the workplace and family success (p. 19).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** 1. *Quality of classroom participation increased*. Students involved as makers and doers in the arts showed the greatest ability to collaborate, reflect, and make choices (p. 36).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

## ***Creativity***

**2008** Arts education not only provides artistic training, but teaches children creativity, spatial thinking and abstract reasoning, all critical skill sets for tomorrow's software designers, scientists, entrepreneurs and engineers (p. 27).  
(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** Compilations of more than 60 peer-reviewed independent studies published in recent years by the national Arts Education Partnership have begun to provide research-based answers to these questions. The studies identify the cognitive capacities — habits of mind and personal dispositions — that are developed as students tackle the specific challenges of an art form: the choreography and movements of a dance; the composition and performance of a piece of music; the script and acting of a drama; the design and

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creation of a painting or sculpture; the writing and performance of an opera. As students learn the content, processes and techniques specific to each of these art forms, they are at the same time developing and applying these capacities.

- \* Imagination. To write or act in a play, design a building or write a song, we must visualize new possibilities for human thought and action and the use of materials. This engages the cognitive capacity of imagination.

- \* Innovation and creativity. When imagination is put into action, the results can be a piece of music, a hybrid car, or a cure for cancer. Getting the results takes discipline, persistence and resilience. One needs to stay on task despite challenges and frustrations of setbacks (p. 14).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2007** Hamilton, OH. Students involved in the SPECTRA arts program made more gains in reading vocabulary, comprehension, and math than a control. Creativity measures were four times higher and gains held during a second-year evaluation (p. 6).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2005** Stumm found that academic ability could be predicted by a creativity test, and that 'high' academic achievers also ranked well on a task requiring imaginative ability. This suggests a relationship between those who do well academically and those who are creatively 'able' (p. 4).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2004** Effects of arts include: ... creativity and expressive skills and art form knowledge and skills, as well as associated transfer effects, that is skills recyclable to other contexts. In this way, we can say that arts may have the potential to offer cultural, educational and even economic inclusion ... and coherent learning pathways and progression (p. 53).

(Kinder, K. & Harland, J. (2004). The arts and social inclusion: What's the evidence? *Support for Learning*, 19, 2, 52-56.)

**2000** Art, for example, attracted low scores for thinking and problem-solving skills, but high scores for creativity, experimentation and imagination. Drama also registered a high number of nominations for imagination, but had proportionately fewer for creativity, although more for thinking and problem-solving skills. Dance was similarly high on imagination, but low on thinking and problem solving skills. Although attracting some references to thinking and problem-solving skills, music was comparatively low for creativity, experimentation, and imagination. In addition to such variations between art forms, the data suggested that the type and level of creativity outcomes varied according to differences in teacher pedagogies and course content (p. 54).

(Harland, J. (2000). What research in the United Kingdom shows about transfer from the arts. In E. Winner & L. Hetland (Ed.), *Beyond the soundbite: arts education and academic outcomes: conference proceedings from Beyond the soundbite: what the*

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*research actually shows about arts education and academic outcomes.* Los Angeles, California: The Getty Center.)

## **Critical/Creative Thinking**

**2008** The arts are an integral part of our learning and growing process. Through the arts we learn about other people and cultures. We learn to look at themes, ideas and perspectives in new and different ways. We also learn to work with others, for collaboration is often one of the distinguishing characteristics of working in the arts (p. 50).

(Jerome, S. (2008). Bringing the arts front and center. *School Administrator*, 65, 3, 50.)

**2008** Harland et al. (2000) suggest that art education outcomes range from the most intrinsic, such as enjoyment and personal achievement in the arts themselves, to related effects, such as the development of creativity and divergent thinking, and their extrinsic transfer to other curriculum areas. According to Bower, teaching the arts to students “has been linked to better visual thinking, problem solving, language and creativity ... by learning and practicing art, the human brain actually wires itself to make stronger connections” (p. 104).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** Students learned best by a multi-sensory approach to learning. Dramatizing afforded students opportunities to see, hear, and create learning opportunities. Dramatic activities also enhanced critical thinking skills of students. ... “Drama activities help transform school from a place where we tell students what to think to a place where we help them experience thinking” (p. 19).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Benefits of arts programs:

- Enhances higher order thinking and learning
- Reinforces aesthetic qualities of students
- Promotes visualization of the content and promotes imagination
- Encourages risk-taking by students expressing creativity (p. 23-24).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** It’s true that students involved in the arts do better in school and on their SATs than those who are not involved. However, correlation isn’t causation, and an analysis we did several years ago showed no evidence that arts training actually causes scores to rise.

There is, however, a very good reason to teach arts in schools, and it’s not the one that arts supporters tend to fall back on ... arts programs teach a specific set of thinking skills rarely addressed elsewhere in the curriculum—and that far from being irrelevant in

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a test-driven education system, arts education is becoming even more important as standardized tests like the MCAS exert a narrowing influence over what schools teach (p. 29).

(Winner, E. & Hetland, L. (2008). Art for our sake: School arts classes matter more than ever—but not for the reasons you think. *Arts Education Policy Review*, 109, 5, 29-31.)

**2008** While students in art classes learn techniques specific to art, such as how to draw, how to mix paint, or how to center a pot, they're also taught a remarkable array of mental habits not emphasized elsewhere in school. Such skills include visual-spatial abilities, reflection, self-criticism, and the willingness to experiment and learn from mistakes (p. 29).

(Winner, E. & Hetland, L. (2008). Art for our sake: School arts classes matter more than ever—but not for the reasons you think. *Arts Education Policy Review*, 109, 5, 29-31.)

**2008** In our analysis, we identified eight “Studio Habits of Mind” that arts classes taught. (THIS IS NOT A DIRECT QUOTE...IT'S SENTENCES FROM THE ARTICLE PIECED TOGETHER.)

1. *Persistence*: Students worked on projects over sustained periods of time and were expected to find meaningful problems and persevere through frustration.
2. *Expression*: Students were urged to move beyond technical skill to create works rich in emotion, atmosphere, and their own personal voice or vision.
3. *Making clear connections between schoolwork and the world outside the classroom*: Students were taught to see their projects as part of the larger art world, past and present.
4. *Observing*: Visual arts students are trained to look.
5. *Envisioning (forming mental images internally and using them to guide actions and solve problems)*: We saw students pushed to notice what they might not have seen before....forming mental images internally and using them to guide actions and solve problems. ... prompting students to imagine what was not there. Like observing, envisioning is a skill with payoffs far beyond the art world. Einstein said that he thought in images. The historian has to imagine events and motivations from the past, the novelist an entire setting. Chemists need to envision molecular structures and rotate them. The inventor—the envisioner par excellence—must dream up ideas to be turned into real solutions.
6. *Innovating through exploration*
7. *Reflective Self-evaluation*: Seeing clearly by looking past one's preconceptions is central to a variety of professions, from medicine to law.
8. *Innovation*(p. 30).

(Winner, E. & Hetland, L. (2008). Art for our sake: School arts classes matter more than ever—but not for the reasons you think. *Arts Education Policy Review*, 109, 5, 29-31.)

**2008** Compilations of more than 60 peer-reviewed independent studies published in recent years by the national Arts Education Partnership have begun to provide research-based answers to these questions. The studies identify the cognitive capacities — habits of mind and personal dispositions — that are developed as students tackle the specific challenges of an art form: the choreography and movements of a dance; the composition



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and performance of a piece of music; the script and acting of a drama; the design and creation of a painting or sculpture; the writing and performance of an opera. As students learn the content, processes and techniques specific to each of these art forms, they are at the same time developing and applying these capacities.

\* Critical thinking. To make and appreciate a good piece of music, a poem or a play, you have to develop and apply criteria and standards for making judgments about quality — evaluate your products or performances and those of others to determine whether they are any good. Fix what’s wrong (p. 14).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** Our recent research at Project Zero, a research and development group at Harvard’s Graduate School of Education, shows that serious instruction in visual arts — and teachers of music, dance and drama suggest that these benefits extend across the arts — teaches habits of higher-order thinking that help students develop capacities to recognize the hidden roots of problems, make careful choices in ambiguous circumstances and seek and synthesize the resources necessary to solve problems in novel ways. High-quality arts education helps students develop important critical and creative thinking that is underdeveloped when schools dedicate themselves only to students’ success on tests (p. 14).

(Hetland, L. (2008). Basically, arts are basic. *School Administrator*, 65, 3, 14-15.)

**2007** “Students in the program performed better in six categories of literacy and critical thinking skills—including thorough description, hypothesizing and reasoning—than did students who were not in the program” (p. 80).

(Reeves, D. (2007). Academics and the arts. *Educational Leadership*, 80-81.)

**2007** The arts are deeply cognitive. No art is understood or created without higher-level thinking. Artistic thinking is characterized by careful observation, pattern finding, new perspectives, qualitative judgment, and use of metaphors and symbols. The arts are used to transform and represent what is noticed and imagined. These kinds of thinking are equally important in science, math, and history (p. 16).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Schools that integrate the arts develop essential thinking such as careful observation of the world; mental representation of what is observed or imagined; abstraction from complexity; pattern recognition and development; qualitative judgment; symbolic, metaphoric, and allegorical representation (p. 35).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** *Arts experiences engage and strengthen higher-order thinking*. These include increases in comprehension/meaning construction, spatial reasoning (the capacity for organizing and sequencing ideas), conditional reasoning (Theorizing about outcomes and consequences), problem solving/decision making, and the components of creative

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thinking )originality, elaboration, and flexibility) (p. 35-36).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** *Critical thinking is developed through the arts*. For example, students used more ‘Evidentiary reasoning’ and broadened their understanding of interpretation itself from discussing paintings (p. 36).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** *Creativity as a “capacity for learning” is expanded*. High arts students are more fluent, flexible, original, elaborative, and willing to resist closure (p. 36).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** A 3-year study of 2,000 students found a significant relationship between rich school arts programs and creative, cognitive, and personal competencies needed for academic success. The study suggests that transfer of learning involves “certain habits of mind which have salience across subject areas.” A key factor was to “invite thinking to travel back-and-forth across subject boundaries” (p. 6).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2005** In *Arts in their View: a Study of Youth Participation in the Arts* Harland, Kinder and Hartley ... report that the ‘arts effects’ evidenced include increases in self-esteem and confidence, as well as enhancement of thinking, organizational skill and other cognitive skills. ... one of the noticed effects on pupils in schools with a good reputation for high-quality creative arts learning situations was a heightened sense of fulfillment and advances in personal development (p. 7).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** In addition, Hetland and Winner found two areas where there was equivocal support: learning to play music and math, dance and non-verbal reasoning. Although they found some evidence, they found no generalisable, reliable causal links for the following oft-cited ‘results’ of arts participation: arts and verbal/math scores; arts and creative thinking; learning to play music and reading; visual arts and reading, and lastly between dance and reading. These authors emphasis that arts participation may well add value to non-arts academic outcomes, but that it is dangerous to justify inclusion of the arts by supposed secondary non-arts effects—the arts should be of value in their own right (p. 8).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2002** This publication shows how the arts can help students develop the essential understanding of metaphors, symbols, and analogies and their potential for communication of ideas.

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(Efland, A. (2002). *Art and cognition*. New York: Teachers College.)

## **2001 Reliable Causal Links Based on Very Few Studies**

*Dance and Nonverbal Reasoning*: Based on 3 reports (4 effect sizes), a small to medium sized causal relationship was found between dance and improved visual-spatial skills. Again, however, more studies are needed before any firm conclusions can be drawn (p. 4).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

## **2001 Areas Where No Reliable Causal Links Were Found**

*Arts-Rich Education and Creative Thinking*: Based on 4 reports (6 effect sizes), no relationship was found between studying arts and verbal creativity test measures. A small to medium sized relationship was found between studying arts and figural creativity tests (which themselves are visual tests) but this relationship could not be generalized to new studies (p. 5).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

**2003** The report (Critical Links) and its interpretive essays reveal some important relationships between learning in the arts and academic and social skills in the following major areas:

*Thinking Skills*. Learning in individual art forms, as well as in multiple arts experiences, engages and strengthens such fundamental cognitive capacities as spatial reasoning, conditional reasoning, problem-solving, and creative thinking (p. 16).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

**2000** This article details the finding that, based on data from pre- and post-administrations of the Torrance Test of Creative Thinking, a group of students receiving a systematic instructional program in the arts made greater gains than either of two control groups on several dimensions, including total creativity, fluency, and originality. The author concludes that "there was a strong indication that creative thinking...was facilitated by involvement in the arts."

(Luftig, R.L. (2000). An investigation of an arts infusion program on creative thinking and academic achievement of children at three grade levels. *Studies in Art Education*.)

**2000** Art, for example, attracted low scores for thinking and problem-solving skills, but high scores for creativity, experimentation and imagination. Drama also registered a high number of nominations for imagination, but had proportionately fewer for creativity, although more for thinking and problem-solving skills. Dance was similarly high on imagination, but low on thinking and problem solving skills. Although attracting some references to thinking and problem-solving skills, music was comparatively low for creativity, experimentation, and imagination. In addition to such variations between art forms, the data suggested that the type and level of creativity outcomes varied according

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to differences in teacher pedagogies and course content (p. 54).

(Harland, J. (2000). What research in the United Kingdom shows about transfer from the arts. In E. Winner & L. Hetland (Ed.), *Beyond the soundbite: arts education and academic outcomes: conference proceedings from Beyond the soundbite: what the research actually shows about arts education and academic outcomes*. Los Angeles, California: The Getty Center.)

## Cultural Awareness

**2008** By increasing access to arts education, the community and schools are increasing students' understanding of other cultures (p. 9).

(Arts education broadens horizons. (2008). *School Administrator*, 65, 9-10.)

**2008** The arts are an integral part of our learning and growing process. Through the arts we learn about other people and cultures. We learn to look at themes, ideas and perspectives in new and different ways. We also learn to work with others, for collaboration is often one of the distinguishing characteristics of working in the arts (p. 50).

(Jerome, S. (2008). Bringing the arts front and center. *School Administrator*, 65, 3, 50.)

**2008** Benefits of arts programs:

- Expands curriculum to other cultures of the world
- Provides an avenue to encourage diversity/multiculturalism (p. 23-24)

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** de Silva and Villas-Boas (2006) report that there were significant differences between pre- and post-tests in an experiment focusing on development of student attitudes regarding respect towards different ethnic/cultural groups. The results revealed that stereotypical and other negative influences stemming from the broader negative influences stemming from the broader community could be better neutralized with an aggressive arts-based approach (p. 21).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2007** Currently, some 400 languages are now spoken in schools nationwide. To live in harmony in such diversity requires appreciation for contributions every culture makes to a society. One source for such understanding is the arts. They are naturally interdisciplinary and provide a neutral ground to learn varied communication symbols, content disciplines, values, and beliefs. The arts help us better understand the joys and sorrows of others (p. 19).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2007** Arts-based teaching and learning “opens avenues.” Students who are not part of the dominant culture benefit from the expanded opportunities for learning the arts provide (p. 37).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2004** ... the arts effects typology also posits outcomes which are not so prominent elsewhere in the disaffection research literature: creativity and expressive skills and art form knowledge and skills, as well as associated transfer effects, that is skills recyclable to other contexts. In this way, we can say that arts may have the potential to offer cultural, educational and even economic inclusion and coherent learning pathways and progression. Indeed, the importance of arts experiences being relevant to – and reflecting – young people’s lives, interests and culture has been identified as crucial to effective arts practices, that is those that encourage high numbers of effects (p. 53).

(Kinder, K. & Harland, J. (2004). The arts and social inclusion: What’s the evidence? *Support for Learning*, 19, 2, 52-56.)

## ***Disadvantaged/Struggling Students***

**2008** “In 2000, the Arts Education Partnership, together with the President’s Committee on the Arts and Humanities, published a groundbreaking report called “Champions of Change.” According to the report, research shows that learners can reach higher levels of achievement through their engagement with the arts. In addition, learning in and through the arts can help level the playing field for disadvantaged youth (p. 34).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** Art-integrated programs are associated with academic gains across the curriculum as reflected in standardized test scores. Further, these programs appear to have a more powerful effect on the achievement of struggling students than more conventional arts education programs targeting the more advanced student (p. 14).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2007** He refers to the National Longitudinal Study of 25,000 students, which showed a strong correlation between the arts and better test scores. What’s more, high arts students “performed more community service, watched fewer hours of television, reported less boredom in school, and were less likely to drop out of school.” Paige points out that the findings held for students from the lowest socioeconomic quartile “belying the assumption that socioeconomic status, rather than arts engagement, contributes to such gains in academic achievement and social involvement.” Read Paige’s letter at [www.ed.gov/policy/elsec/guid/secletter/040701.html](http://www.ed.gov/policy/elsec/guid/secletter/040701.html) (p. 15).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2007** Problem students often become the high achievers in arts learning settings. Success in the arts can be a bridge to success in other areas of learning, as is demonstrated in case studies of disadvantaged students in New York City involved in ArtsConnection.

Students used more self-regulatory behaviors and had a sense of identity that made them more confident and resilient (p. 20).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Literature, visual art, drama, dance, and music have the power to energize and humanize the curriculum. Integrated arts schools are acting on research that confirms how arts experiences help “level the educational playing field” for disadvantaged students and “close the achievement gap” (p. 11).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** *Arts experiences especially benefit “undereducated” students* (p. 35).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** The arts engage and offer challenges for all students—at risk, disadvantaged, delayed, and gifted from every cultural background.

1. *Arts-based teaching engages a wide range of learners.* By introducing flexibility, teachers can better promote individuality and diversity. All arts-involved students showed higher levels of learning, especially at-risk and underachieving students. Students who have struggled with traditional modes of instruction find success in inclusive environments that build on commonalities, while respecting differences.

3. *Significant relationships and improvements in reading, writing, and math were found.* This research focused on disadvantaged low-scoring students involved in the arts experiences such as using multimedia from photographs, objects, and videos to advanced computer software (p. 37).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** A study of 10 “high-poverty” schools in the continental United States found that arts integration and arts education contributed significantly to closing the achievement gap (p. 10).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2006**, Nick Jaffe’s K-8 students create, perform, critique, engineer, and produce dozens of original projects in music recording classes at a Chicago elementary school (p. 61). ... The majority of competent engineers and technical specialists are female students. Kids who have a terrible time collaborating end up directing complex productions, sometimes working with their ‘enemies.’ Bookish kids end up singing or rapping. Students with social or emotional problems show amazing focus and intensity, taking on tasks they find

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most frustrating in regular classrooms. Students with writing difficulties spend hours writing lyrics. Problem students often show exceptional creative depth and come up with more sophisticated musical and artistic ideas than their peers do (p. 62).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2006** Broadly understood as affective and expressive—not academic or cognitive—the arts survive at the margins of education as curriculum enrichments, rewards to good students, or electives for the talented. But evidence is now emerging that shows that arts education can have powerful effects on student achievement. Moreover, these effects may be most profound for struggling students (p. 60).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2005** Arts-integrated schools reported substantial effects for all students. The greatest impact was for disadvantaged students. “Students become better thinkers, develop higher order skills, and deepened their inclination to learn” (Rabkin, N & Redmond, R. (2005, January 8). The art of education success. *Washington Post*, A19.)

**2003** According to a new and comprehensive research report, good arts programs in elementary and middle schools not only build skills needed to learn other subjects, including reading, writing, and math, but motivate students to learn—particularly those at risk of failure (p. 15).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don’t axe the arts! *Principal*, 14-18.)

**2003** Of great importance to schools struggling to close achievement gaps are indications that for certain students—most notably young children, those from economically disadvantaged circumstances, and those needing remedial instruction—learning in the arts may be particularly helpful. For instance, studies show that some students who are encouraged to dramatize reading material significantly improve their comprehension of the text and their ability to read new and unfamiliar material (p. 16-17).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don’t axe the arts! *Principal*, 14-18.)

**2002** This article details the findings of the 1993 National Household Education Survey, which analyzed factors that affect the cognitive readiness of four-year-old preschool students. Of the preschoolers in the national sample considered at-risk, those who participated in culture-related activities were associated with higher levels of cognitive development and lower variability in cognitive readiness.

(Beasley, T.M. (2002). Influence of culture-related experiences and sociodemographic risk factors on cognitive readiness among preschoolers. *Journal of Education for Students Placed at Risk*.)

**2001** “Champions of Change: The Impact of the Arts on Learning”: They report a wide range of positive impacts of arts learning on the academic and personal success of the

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students, including significant benefits for disadvantaged children and for high-poverty schools (p. 38).

(Deasy, R. J. & Fubright, H. M. (2001). The arts' impact on learning. *Education Week*, 20, 19, 34-35.)

**1999** Analysis of these studies indicates that the use of creative drama to enhance the reading scores of a population of remedial or low-ability fifth graders enrolled in a compensatory program proved effective at the .05 level compared to the performance of two other groups of students using methods that did not include creative drama (Du Pont, 1992). It must be noted that the aim of the program was to increase reading performance, not to teach creative drama, and that the population was a special population of fifth graders in need of reading skills, not a population of average students. In short, given the aims of the study and the population studied, the results are limited to like populations (p. 144).

(Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

**1998** Studies indicate that creative drama can serve to remediate difficulties in social and language skills (p. 89). Children with LD (learning disabilities) can improve and maintain social and oral expressive language (speaking) skills through drama. ... Creative drama basically entails self-expressive, social interactions which emphasize speaking spontaneously in improvisations, thereby leading to better interpersonal communication skills (p. 93).

(de la Cruz, R. E., Lian, M.G.J., Morreau, L. E. (1998). The effects of creative drama on social and oral language skills of children with learning disabilities. *Youth Theatre Journal*, 12, 89-95.)

## English Language Acquisition

**2008** For students who speak little or no English and who may face other barriers to fully engaging in the life of the school, the arts are the 'languages' that reveal their abilities and potential to teachers—the crucial connection that motivates them to learn (p. 12).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** "I think the work done here suggests a much closer connection between the cognitive processes that give rise to the arts and the cognitive processes that give rise to the sciences" (Elizabeth S. Spelke, p. 1). ... the Dana Foundation of New York City in 2004 brought together neuroscientists and cognitive psychologists from seven universities to launch a broad program of studies looking at how experience in dance, music, theater, and visual arts might spill over into other areas of learning, and to explore possible mechanisms for those links in the anatomy of the brain—even at the genetic level. "Left unsettled, experts say, is whether the arts make people smarter or whether smart people simply gravitate to the arts." "While the report still doesn't provide any



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definitive answers to the arts-makes-you-smarter question, it sounds a final death knell to the myth that students are either right- or left-brained learners. It also offers hints on how arts learning might conceivably spill over into other academic domains.” Other studies in the mix also suggest a link between music learning and speaking fluency in second-language (p. 10). ... “What we are seeing here is that we have quantitative data that confirm our assumptions about the interrelationships in the way children learn ... And the purpose of education is to realize the full human potential of every child (p. 11). (Viadero, D. (2008). Insights gained into arts and smarts. *Education Week*, 27, 27, 1-11.)

**2008** She’s trying something new — a longitudinal action-research project to equip her teachers to use arts as learning resources. By helping teachers link authentic arts learning with English language learning, the project will support teachers in building arts and teaching skills to better engage the neediest students. They’ll learn to use arts to motivate thinking, speaking, reading and writing and, beyond motivation, to make students’ learning visible so teachers can better target instruction to individual needs. The county superintendent is impressed, and she’s bringing all 18 superintendents in the county together to consider such arts-infused strategies (p. 14). (Hetland, L. (2008). Basically, arts are basic. *School Administrator*, 65, 3, 14-15.)

**2007** The principal observed, “It is the only opportunity for some of those children to attach meaning to what we’re doing ... Because they’re not understanding the language ... it’s hard for them to read a fifth grade content book, their reading level may not be fifth grade content, but they see it, they do it, they act it out, it’s fun, it’s engaging, they remember it. They’re able to attach meaning to that and build on their experiences” (p. 36-37). (Lynch, P. (2007). Making meaning many ways: An exploratory look at integrating the arts with classroom curriculum. *Art Education*, 60, 4, 33-38.)

**2007** Students at Opening Minds through the Arts (OMA) schools have significantly higher scores in math, reading, and writing than non-OMA students. The arts have closed the gap between minority and white students (p. 6).

Opening Minds Through the Arts is an arts integration project currently being implemented in the Tucson Unified School District in Arizona. The OMA® Project was developed around brain-based learning theories designed to impact at-risk children and significantly increase student achievement. The goal of OMA® is to help all students succeed by actively supporting and positively engaging students in all subjects through the arts. <http://www.ed.gov/news/av/video/edtv/2004/0503-resources.html> (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Escondido, CA. K-5 multilingual students made significant gains in English and comprehension with arts integration. The SAUVE program received a development and dissemination grant in 2003 (p. 6).

The California Center for the Arts, Escondido Foundation (The Center), will implement project, SUAVE: A Model Approach to Teaching English Language Learners

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Through the Arts. The project will further develop, evaluate, and disseminate its nationally recognized model arts learning program SUAVE (Socios Unidos Para Artes Via Educación—"United Communities for Arts in Education"). The SUAVE project, a collaborative venture of The Center, Cal State San Marcos, and local partner school districts, is an educational and cultural partnership designed to infuse the arts into core curriculum instruction in multicultural and multilingual settings. SUAVE pairs The Center's resident artists, called "arts coaches," with classroom teachers to develop strategies that integrate multiple disciplines-visual arts, music, dance, theater-into instruction of core subjects such as language arts, mathematics, science, and social studies, as well as to develop knowledge of the arts in and of themselves.

SUAVE will support activities for three purposes:

- \* Document and research learning outcomes using a randomized experimental design for students who experience arts-infused core English Language instruction;
- \* further refine already demonstrated elements of SUAVE as a professional development program for teachers; and
- \* Disseminate SUAVE best practices on a regional and national level at a conference on Arts Learning in 2004, SUAVE's 10th anniversary, with the goal of improving opportunities for the expansion of the role of the arts in pre-K to 12 schools.

The project will involve more than 50 teachers and 1,500 students over a three-year period from five school sites at two school districts, one inner city and one rural, in North San Diego County with substantial numbers of at-risk English language learners (ranging from 28% to 80%). <http://www.ed.gov/programs/artsedmodel/2003awards.html> (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Arts integration is significantly related to gains in reading scores for students in grades 3-5 and is more effective for English language learners and students from low socioeconomic homes (p. 10).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** An ArtsPartners school, Hogg Elementary students—mostly ELLs from poor neighborhoods—are turning out writing like advantaged students. By fourth grade they write like sixth graders (p. 10).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

## **Generalized Student Achievement**

**2008** "In 2000, the Arts Education Partnership, together with the President's Committee on the Arts and Humanities, published a groundbreaking report called "Champions of Change." According to the report, research shows that learners can reach higher levels of achievement through their engagement with the arts. In addition, learning in and through the arts can help level the playing field for disadvantaged youth (p. 34).

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(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** In *More Than Words Can Say*, Joan Livermore argues that the arts “can facilitate personal and social development. Learning in other curriculum areas and the development of a range of skills and understandings that can be applied in vocational and other life situations.” ... important cognitive and social processes and capabilities are developed in and through arts-learning experiences (p. 104).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** Arnold Aprill, Executive Director of the Chicago Arts Partnership in Education (CAPE), makes the claim that “the arts do indeed increase student achievement when achievement is conceived of in rich and complex ways, and when the authentic connections between the arts and the rest of learning are acknowledged and developed over time” (p. 104).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** According to Floyd, students who studied instrumental music averaged up to 304 points higher on their Scholarship Aptitude Tests (SATs) (p. 104).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** Art-integrated programs are associated with academic gains across the curriculum as reflected in standardized test scores. Further, these programs appear to have a more powerful effect on the achievement of struggling students than more conventional arts education programs targeting the more advanced students (p. 14).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** “In 2006, Scottish Executive Social Research published “Arts and Employability,” which investigated the effect of an arts education on later employability by examining longitudinal data of nearly 12,000 young people. The most intriguing empirical findings include these:

- \* The rate of employment appears higher among young people leaving school at a later stage who took arts subjects, compared to those who did not take arts subjects; and
- \* Students who took at least two arts subjects at standard grade tended to have a higher rate of employment than those who took only one arts subject.

The data also show that taking arts courses in school benefits occupations that do not require secondary education:

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- \* Among young people leaving school at the earliest opportunity, employability is generally higher for those who had studied arts subjects;
- \* Students who leave school at an early stage after having taken arts subjects are less likely to find themselves in a negative labor market position three years later, compared to the average young person leaving school early; and
- \* Young people who had studied music or graphic communication are among the most employable of those who leave school at the earliest opportunity.

The report offers an encouraging assessment of the importance of an arts education to workforce development: “[Y]oung people from lower socioeconomic backgrounds gaining confidence at school, as demonstrated by drama or music students, are more likely to enjoy higher salaries and enter professional or managerial jobs” (p. 28). (Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** “I think the work done here suggests a much closer connection between the cognitive processes that give rise to the arts and the cognitive processes that give rise to the sciences.” ... the Dana Foundation of New York City in 2004 brought together neuroscientists and cognitive psychologists from seven universities to launch a broad program of studies looking at how experience in dance, music, theater, and visual arts might spill over into other areas of learning, and to explore possible mechanisms for those links in the anatomy of the brain—even at the genetic level. Left unsettled, experts say, is whether the arts make people smarter or whether smart people simply gravitate to the arts. ... While the report still doesn’t provide any definitive answers to the arts-makes-you-smarter question, it sounds a final death knell to the myth that students are either right- or left-brained learners. It also offers hints on how arts learning might conceivably spill over into other academic domains. ... students who came to the study with more musical training tended to make faster gains in reading fluency than did students with no musical backgrounds. ... “Listening carefully to other sounds has long been thought to be important to the development of phonological awareness and reading fluency.” ... the Stanford researchers also found preliminary evidence suggesting a link between visual-arts lessons outside of school and children’s skill at math calculations, possibly because both activities involve recognizing patterns. ... middle and high school students who studied music intensively, typically because they were enrolled in special schools for the arts, were better than students with little or no musical training at tasks involving basic geometric skills, but not at tasks involving other kinds of fundamental mathematical systems, such as basic number representation. Other studies in the mix also suggest a link between music training and skill at manipulating information in both long term and working memory; between music learning and speaking fluency in second-language learning; and dance and the ability to learn by observing movement. Training in acting, also appears to lead to memory improvement. One way that arts learning might lead to improved thinking skills ... might be in motivation students to pay attention (p. 10). ... Spatial skills and other nonverbal IQ skills did improve in the music students over the course of the eight-week study, but that was also true for the children who got attention training and the Head Start children who worked in small groups. Only the children in the large Head Start class failed to make any

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progress in those areas. ... “What we are seeing here is that we have quantitative data that confirm our assumptions about the interrelationships in the way children learn,” said poet Dana Gioia, the chairman of the National Endowment for the Arts, at the Dana conference. “And the purpose of education is to realize the full human potential of every child” (p. 11).

(Viadero, D. (2008). Insights gained into arts and smarts. *Education Week*, 27, 27, 1-11.)

**2007** SAT scores for students who studied visual art are 47 points higher in math and 31 points for the verbal portion over nonarts students. Students with music backgrounds averaged 49 points higher on combined scores. Students with drama and dance backgrounds scored 44 points and 27 points higher, respectively. See SAT Results at [www.collegeboard.com](http://www.collegeboard.com) (p. 10).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** A solid body of evidence correlates meaningful teaching through the arts with higher academic achievement and desirable personal and social behaviors (p. 34).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** As more teachers use the motivation and communication powers of the arts, reports of increased concentration, more cooperation, better comprehension, and greater self-discipline among students are on the rise (p. 34).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** ...dozens of studies are finding the same thing: Significant arts involvement changes how children think and how they feel about learning. That fact is reflected in test scores and in vast quantities of survey, interview, observation, and anecdotal evidence (p. 35).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

## **2007 Academic Achievement as Measured by Test Scores**

1. *Arts-involved students score higher than other students.* Differences range significantly from 16 to 18 percentage points (test scores). Students whose parents had lower incomes scored lower, but their scores were still significant.
2. *Greater arts integration yields higher test scores.* Longer and more intense work in the arts had more impact. This effect was particularly strong for low-income and ESL students.
3. *Academic achievement builds over time.* “Gain scores” (year-over-year comparisons) were significantly higher for third, fourth, and fifth graders in arts integrated classrooms.
4. *Arts experiences especially benefit “undereducated” students* (p. 35).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2007** Thirty-seven arts-based CAPE schools outscored nonarts schools on the Illinois Test of Basic Skills and the Illinois State IGAP test (reading and math). By sixth grade, more than 60% of CAPE students were performing at grade level. This gain is sizable and significant. By ninth grade CAPE students were a full grade level higher than non-CAPE students in reading (p. 60).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** New York, Connecticut, Virginia, and South Carolina In a study of 2,000 students, grades 4-8, researchers found “significant relationships between rich in-school arts programs and creative, cognitive, and personal competencies needed for academic success” (p. 60).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Dallas, TX. Partnership for Arts, Culture, and Education, Inc. (PACE) reports that integrating the arts into the core curriculum positively affects academic performance. Three urban elementaries were studied. After 4 years, students in the integrated arts school had higher average standardized test scores in language arts than students from the other schools (p. 60).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Bronx, NY. At St. Augustine School, 98% of students were at grade level after participating in an arts-integrated curriculum (p. 60).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Charleston, SC. More than 90% of students in grades 1-3 have met basic skills standards in reading and math at Ashley River Creative Arts Elementary. Ninety-six percent meet basic standards in other subjects as well. These rates are about 10 percent higher than other South Carolina schools (p. 60).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Augusta, GA. Students at the Redcliffe Elementary Arts Infusion School showed gains on the Stanford Achievement Test for each year of the project (p. 60).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Chicago. Twenty-three arts-integrated CAPE schools showed test scores rising up to two times faster than in demographically comparable schools (p. 6).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2007** Test scores of arts-involved students are generally higher than those who aren't. The arts help students "exercise your mind in unique ways." See SAT Results at [www.collegeboard.com](http://www.collegeboard.com) (p. 6).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** A 3-year study of 2,000 students found a significant relationship between rich school arts programs and creative, cognitive, and personal competencies needed for academic success. The study suggests that transfer of learning involves "certain habits of mind which have salience across subject areas." A key factor was to "invite thinking to travel back-and-forth across subject boundaries" (p. 6).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Students in 130 arts-based Waldorf schools outperformed national averages on the SAT (p. 10).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** A meta-analysis of 30 studies showed students in arts integrated programs consistently outperformed those in traditional classrooms on national and states tests (p. 9).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Dallas, Texas Four thousand five hundred teachers now integrate field trips and arts residencies into literacy, science, and social studies. More than 150 public schools work with museums, theatres, and other arts groups to boost academic achievement. ArtsPartners teachers replace "drive-by art" field trips with learning tied to the state-mandated curriculum. Standardized tests show bigger strides in literacy, especially writing. Scores of students with the most arts involvement rose 10 points—as compared to 3 points for the control group (p. 10).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2006** Broadly understood as affective and expressive—not academic or cognitive—the arts survive at the margins of education as curriculum enrichments, rewards to good students, or electives for the talented. But evidence is now emerging that shows that arts education can have powerful effects on student achievement. Moreover, these effects may be most profound for struggling students (p. 60).  
(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2006** Investigators who sliced and diced the massive National Education Longitudinal Study of 1988 (NELS: 88) database found a significant correlation growing over time, between arts participation and academic performance (p. 60).

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(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2005** This publication reports case studies of ten schools that serve large percentages of at-risk students and use arts-integrated instruction to bring about student gains in various subjects, as well as to create an environment that is conducive to cognitive and social development. Researchers determined that arts-integrated learning experiences offered rich opportunities for developing higher order thinking skills. See Chapter 3: Thinking in the Arts. They also found that performance in the arts heightened students' self-efficacy and engagement and awakened their desire to make a contribution. See Chapter 2: When Learning Matters.

(Stevenson, L. M. & Deasy, R. J. (2005). *Third space: When learning matters*. Washington, D.C.: Arts Education Partnership.)

**2005** 'Students who received the Learning Through the Arts curriculum for one year attained significantly higher scores on their achievement tests than students who received the traditional curriculum' (p. 4).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** Arts impact research suggests that is it exposure to arts experiences that can generate attendant success in other non-arts areas (p. 4).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** Music training enhances verbal memory in both adult musicians and children. Music training has also been shown to raise IQ modestly consistent with a report by Gardiner, Fox, Knowles, and Jeffrey (1996) that children receiving both art and music instructions improved on standardized test scores. Further, children with dyslexia have been found to improve on phonemic awareness and spelling tests after only 15 weeks of rhythm-based music training (p. 125-126).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2004** This article summarizes four studies (Champions of Change: The Impact of the Arts on Learning; Critical Links: Learning in the Arts and Student Academic and Social Development; Creativity, Culture, Education and the Workforce; and The National Assessment of Educational Progress 1997 Arts Report Card) in which arts education is shown to foster problem-solving and creative-thinking skills in students, as well as encourage increased self-confidence and empathy.

(Weiss, S. (2004). The arts in education. *The Progress of Education Reform*, 5(1). <http://www.ecs.org/clearinghouse/49/91/4991.pdf>)

**2001** "Champions of Change: The Impact of the Arts on Learning": They report a wide range of positive impacts of arts learning on the academic and personal success of the



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students, including significant benefits for disadvantaged children and for high-poverty schools (p. 38).

(Deasy, R. J. & Fubright, H. M. (2001). The arts' impact on learning. *Education Week*, 20, 19, 34-35.)

**2001** In a quantitative synthesis of 188 studies, Winner and Hetland found few causal relationships between learning in the arts and improved academic achievement in other areas. The researchers discovered slight effects in some specific areas, such as a link between listening to music and improved spatial reasoning. But they caution educators not to 'get brainwashed by today's testing mentality' and not to claim that arts programs will raise kids test scores. Such unwarranted assumptions, they say, could cause the arts—dance and all—to be written out of the curriculum (p. 32).

(Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)

**2001** This publication makes a strong case, based on research, that the arts should be a core subject. Eric Jensen, an expert in brain-based teaching and learning, cites research suggesting that arts education helps decrease the number of dropouts, boosts attendance, instills team building skills, enhances creativity, and provides other benefits that influence academic and career success. He describes in detail how the arts aid learning. (Jensen, E. (2001). *Arts with the brain in mind*. Alexandria, VA: Association of Supervision and Curriculum Development. <http://www.jlcbrain.com>)

**2000** James Catterall, a UCLA researcher, studied 25,000 students in grades 8 to 10. He discovered that students "highly involved in arts programs" fare better in other subjects too and are "much less likely to drop out" of school or become uninterested in school life. Catterall's study also shows that students from low-income families who participate in arts experiences are more likely to do better academically than those who do not. Not only do students' attitudes, attendance, abilities, and grades dramatically improve when the arts become part of their school life, but "research shows that arts education programs result in measurable gains in student motivation and achievement in reading, writing, and mathematics" — exactly what traditional school proponents want to accomplish (p. 11). (Milner, J. (2000). Research supports arts in education. *Performing Arts & Entertainment in Canada*, 33, 2, p. 11.)

**2000** This article details the intellectual, developmental, and creative skills identified by Elliot Eisner, Lee Jacks Professor of Education at Stanford University, as those strengthened through arts learning. Among the key cognitive skills revealed in the article, participation in the arts teaches children to examine qualitative relationships, manage problems with multiple solutions, take advantage of unexpected opportunities, and create within the confines of a material.

(Eisner, E. (2000). Ten lessons the arts teach. *Learning in the Arts: Crossing Boundaries*. [http://www.giarts.org/usr\\_doc/Learning.pdf](http://www.giarts.org/usr_doc/Learning.pdf))

**2000** This article summarizes the findings of the Reviewing Education and the Arts Project (REAP) by Harvard's Project Zero. A search for all English language studies between 1950 and 1999 found that learning in the arts leads to academic improvement in

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other areas. Cites clear causal links demonstrated between spatial-temporal reasoning and both listening to music and learning to play music.

(Hetland, L. & Winner, E., eds. (2000). The arts and academic achievement: What the evidence shows. *The Journal of Aesthetic Education*.

<http://www.pz.harvard.edu/Research/Reap/REAPExecSum.htm>)

**2000** ... when social class and prior attainment were controlled for, taking two-year art, drama, or music courses from fourteen to sixteen was not positively associated with examination performances in English and mathematics. Where such variables are not controlled for, it is maintained that any correlations disclose more about the characteristics of the pupils taking different arts-related courses than any purported impact on general academic performance (p. 51).

(Harland, J. (2000). What research in the United Kingdom shows about transfer from the arts. In E. Winner & L. Hetland (Ed.), *Beyond the soundbite: arts education and academic outcomes: conference proceedings from Beyond the soundbite: what the research actually shows about arts education and academic outcomes*. Los Angeles, California: The Getty Center.)

**1999** This article examines what makes the programs of Shakespeare & Company, a classical professional theatre organization that teaches Shakespeare in K-12 schools, so effective. Four major learning areas are identified from responses submitted by the nearly 800 students who participated in the study: Shakespeare and his language, acting, creative communities, and self as learner. Project Zero's research indicates that reading and acting Shakespeare's works promote confidence in interpreting various forms of complex text (including mathematical theorems), as well as a greater awareness of others and a sense of community between peers working toward a common goal.

(Seidel, S. (1999). Stand and unfold yourself. *Champions of change: The impact of the arts on learning*. <http://aep-arts.org/PDF%20Files/ChampsReport.pdf>)

**1995** This publication details various national studies in which arts education was shown to strengthen creativity and promote communication and problem-solving skills in students. In one notable study, creativity measures for students who participated in the SPECTRA+ Program were four times higher than their peers who did not participate in an arts curriculum. In addition, a review of 57 studies indicates that participation in the arts promotes a higher self-concept and improved social skills.

(Murfee, E. (1995). Eloquent evidence: Arts at the core of learning. <http://www.nasaa-arts.org/publications/eloquent.pdf>)

## Math

**2008** "Champions of Change" also reports that sustained involvement in music and theater are highly correlated with success in mathematics and reading and that "the arts provide young people with authentic learning experiences that engage their minds, hearts and bodies" (p. 34).

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(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** “I think the work done here suggests a much closer connection between the cognitive processes that give rise to the arts and the cognitive processes that give rise to the sciences” (Elizabeth S. Spelke, p.1). ... the Dana Foundation of New York City in 2004 brought together neuroscientists and cognitive psychologists from seven universities to launch a broad program of studies looking at how experience in dance, music, theater, and visual arts might spill over into other areas of learning, and to explore possible mechanisms for those links in the anatomy of the brain—even at the genetic level. Left unsettled, experts say, is whether the arts make people smarter or whether smart people simply gravitate to the arts. “While the report still doesn’t provide any definitive answers to the arts-makes-you-smarter question, it sounds a final death knell to the myth that students are either right- or left-brained learners. It also offers hints on how arts learning might conceivably spill over into other academic domains.” ... Researchers found preliminary evidence suggesting a link between visual-arts lessons outside of school and children’s skill at math calculations, possibly because both activities involve recognizing patterns. ... Middle and high school students who studied music intensively, typically because they were enrolled in special schools for the arts, were better than students with little or no musical training at tasks involving basic geometric skills, but not at tasks involving other kinds of fundamental mathematical systems, such as basic number representation (p. 10). “What we are seeing here is that we have quantitative data that confirm our assumptions about the interrelationships in the way children learn ... And the purpose of education is to realize the full human potential of every child” (p. 11). (Viadero, D. (2008). Insights gained into arts and smarts. *Education Week*, 27, 27, 1-11.)

**2008** In 2004, the Dana Arts and Cognition Consortium brought together cognitive neuroscientists from seven universities across the United States to grapple with the question of why arts training has been associated with higher academic performance. Is it simply that smart people are drawn to “do” art—to study and perform music, dance, drama—or does early arts training cause changes in the brain that enhance other important aspects of cognition? ... Here is a summary of what the group has learned:

9. In children, there appear to be specific links between the practice of music and skills in geometrical representation, though not in other forms of numerical representation.

Although scientists must constantly warn of the need to distinguish between correlation and causation, it is important to realize that neuroscience often begins with correlations—usually, the discovery that a certain kind of brain activity works in concert with a certain kind of behavior. ... Many of the studies cited here tighten up correlations that have been noted before, thereby laying the groundwork for unearthing true causal explanations through understanding biological and brain mechanisms that may underlie those relationships.

... In my judgment, this project has identified candidate genes involved in the predisposition to the arts and has also shown that cognitive improvements can be to specific mental capacities such as geometric reasoning; that specific pathways in the brain can be identified and potentially changed during training; that sometimes it is not

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structural brain changes but rather changes in cognitive strategy that help solve a problem; and that early targeted music training may lead to better cognition through an as yet unknown neural mechanism. All of those findings are rather remarkable and challenging.

(Gazzaniga, M. S. (2008). Arts and cognition: Findings hint at relationships. 2008 Progress Report on Brain Research. The Dana Press. 7-12.)

**2007** *Music instruction develops math-related skills.* Spatial reasoning and spatial-temporal reasoning skills used in music are fundamental to understanding and using mathematical ideas and concepts (p. 36).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Students at Opening Minds through the Arts (OMA) schools have significantly higher scores in math, reading, and writing than non-OMA students. The arts have closed the gap between minority and white students (p. 6).

Opening Minds Through the Arts is an arts integration project currently being implemented in the Tucson Unified School District in Arizona. The OMA® Project was developed around brain-based learning theories designed to impact at-risk children and significantly increase student achievement. The goal of OMA® is to help all students succeed by actively supporting and positively engaging students in all subjects through the arts. <http://www.ed.gov/news/av/video/edtv/2004/0503-resources.html>

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** South Carolina. Arts in Basic Curriculum (ABC) evaluators analyzed 3 years of state tests in English/Language Arts and math. They found a steady increase in the percent of students identified as proficient or advanced in ABC schools, as compared to the comparison group (p. 6).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** A 3-year study of more than 6,000 elementary students in Learning to Read Through the Arts showed an 11 point increase in math in the 170 schools. Literacy scores remained the same, but students reported being happier about school and researchers saw them as more engaged (p. 10).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Hamilton, OH. Students involved in the SPECTRA arts program made more gains in reading vocabulary, comprehension, and math than a control. Creativity measures were four times higher and gains held during a second-year evaluation (p. 6).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2005** Arts-participating experimental groups made ‘gains in mathematics achievement that were statistically significant (p. 3).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** In addition, Hetland and Winner found two areas where there was equivocal support: learning to play music and math, dance and non-verbal reasoning. Although they found some evidence, they found no generalisable, reliable causal links for the following oft-cited ‘results’ of arts participation: arts and verbal/math scores; arts and creative thinking; learning to play music and reading; visual arts and reading, and lastly between dance and reading. These authors emphasis that arts participation may well add value to non-arts academic outcomes, but that it is dangerous to justify inclusion of the arts by supposed secondary non-arts effects—the arts should be of value in their own right (p. 8). (Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** Previous research has demonstrated that music training enhances visual-spatial abilities in young children. Music training appears to enhance performance on the WISC-III Object Assembly, a task that requires mental rotation, but has no effect on Raven’s Progressive Matrices, a task considered non-spatial. The ability to copy geometric forms which requires coordination between visual perception and motor planning, has also been found to be enhanced by music training (p. 125).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2005** ... studies have also shown that music training can have positive effects on motor skills. The tapping rate of both the right and the left index fingers was shown to be faster in musicians than in non-musicians, and the tapping rate of the non-dominant hand was found to increase with training. This higher tapping rate in keyboard players also correlated with a greater intrasulcal length of the posterior precentral gyrus (a gross marker of primary motor cortex size). Taken together, the research suggests that music training may have positive effects on spatial, mathematical, verbal, and motoric ability (p. 126).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2001 Reliable Causal Links Based on Very Few Studies** *Learning to Play Music and Mathematics*: Based on 6 reports (6 effect sizes), a small causal relationship was found between music training and math. However, while 3 of these studies produced medium effects, 3 produced either very small effects or none at all. If the two studies measuring pre-school math rather than school math had not been included (because these were measures of spatial recognition and perception), a reliable effect would have resulted. However, more studies are needed before any firm conclusions can be drawn (p. 4).

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(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

## **2001 Areas Where No Reliable Causal Links Were Found**

*Arts-Rich Education and Verbal and Mathematics Scores/Grades:* Based on 31 reports (66 effect sizes), a small to medium correlation was found between studying the arts and academic achievement as measured primarily by test scores. However, no evidence was found that studying the arts causes academic indicators to improve. The correlational findings can be explained by non-causal mechanisms. For example, high achieving students (no matter what their ethnic or racial group, no matter what their social class) may choose or be guided to study the arts. This would then result in the finding that students who take arts courses are also high-achieving, high test-scoring students (p. 4-5). (Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

**2003** According to a new and comprehensive research report, good arts programs in elementary and middle schools not only build skills needed to learn other subjects, including reading, writing, and math, but motivate students to learn—particularly those at risk of failure (p. 15).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

**2003** The report (Critical Links) and its interpretive essays reveal some important relationships between learning in the arts and academic and social skills in the following major areas:

*Mathematics.* Certain types of music instruction develop spatial reasoning and the spatial-temporal reasoning skills that are integral to understanding and using mathematical ideas and concepts (p. 16).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

## **2000 Music to Maths**

Once social class and prior attainment in maths were controlled for, there was no significant positive association between taking courses in music or participation in extra curricular music and GCSE performance in maths. Art and drama attracted more references to transfers to learning in other subjects than music. Only one of the latter cited a transfer to maths: ... music and maths. It might not seem like it, but you have to time bars and things and add them up and that process helps you in other subjects (year seven) (p. 52).

(Harland, J. (2000). What research in the United Kingdom shows about transfer from the arts. In E. Winner & L. Hetland (Ed.), *Beyond the soundbite: arts education and academic outcomes: conference proceedings from Beyond the soundbite: what the research actually shows about arts education and academic outcomes*. Los Angeles, California: The Getty Center.)

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## Memory

**2008** “I think the work done here suggests a much closer connection between the cognitive processes that give rise to the arts and the cognitive processes that give rise to the sciences.” ... the Dana Foundation of New York City in 2004 brought together neuroscientists and cognitive psychologists from seven universities to launch a broad program of studies looking at how experience in dance, music, theater, and visual arts might spill over into other areas of learning, and to explore possible mechanisms for those links in the anatomy of the brain—even at the genetic level. Left unsettled, experts say, is whether the arts make people smarter or whether smart people simply gravitate to the arts. ... While the report still doesn’t provide any definitive answers to the arts-makes-you-smarter question, it sounds a final death knell to the myth that students are either right- or left-brained learners. It also offers hints on how arts learning might conceivably spill over into other academic domains. ... Other studies in the mix also suggest a link between music training and skill at manipulating information in both long term and working memory; ... Training in acting, also appears to lead to memory improvement (p. 10). ... “What we are seeing here is that we have quantitative data that confirm our assumptions about the interrelationships in the way children learn ... And the purpose of education is to realize the full human potential of every child” (p. 11). (Viadero, D. (2008). Insights gained into arts and smarts. *Education Week*, 27, 27, 1-11.)

**2008** In 2004, the Dana Arts and Cognition Consortium brought together cognitive neuroscientists from seven universities across the United States to grapple with the question of why arts training has been associated with higher academic performance. Is it simply that smart people are drawn to “do” art—to study and perform music, dance, drama—or does early arts training cause changes in the brain that enhance other important aspects of cognition? ... Here is a summary of what the group has learned:

- Specific links exist between high levels of music training and the ability to manipulate information in both working and long-term memory; these links extend beyond the domain of music training.
- Training in acting appears to lead to memory improvement through the learning of general skills for manipulating semantic information.

Although scientists must constantly warn of the need to distinguish between correlation and causation, it is important to realize that neuroscience often begins with correlations—usually, the discovery that a certain kind of brain activity works in concert with a certain kind of behavior. ... Many of the studies cited here tighten up correlations that have been noted before, thereby laying the groundwork for unearthing true causal explanations through understanding biological and brain mechanisms that may underlie those relationships.

... In my judgment, this project has identified candidate genes involved in the predisposition to the arts and has also shown that cognitive improvements can be to specific mental capacities such as geometric reasoning; that specific pathways in the brain can be identified and potentially changed during training; that sometimes it is not structural brain changes but rather changes in cognitive strategy that help solve a problem; and that early targeted music training may lead to better cognition through an as

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yet unknown neural mechanism. All of those findings are rather remarkable and challenging.

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**2005** Music training enhances verbal memory in both adult musicians and children. Music training has also been shown to raise IQ modestly consistent with a report by Gardiner, Fox, Knowles, and Jeffrey (1996) that children receiving both art and music instructions improved on standardized test scores. Further, children with dyslexia have been found to improve on phonemic awareness and spelling tests after only 15 weeks of rhythm-based music training (p. 125-126).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

## Motivation

**2008** Compilations of more than 60 peer-reviewed independent studies published in recent years by the national Arts Education Partnership have begun to provide research-based answers to these questions. The studies identify the cognitive capacities — habits of mind and personal dispositions — that are developed as students tackle the specific challenges of an art form: the choreography and movements of a dance; the composition and performance of a piece of music; the script and acting of a drama; the design and creation of a painting or sculpture; the writing and performance of an opera. As students learn the content, processes and techniques specific to each of these art forms, they are at the same time developing and applying these capacities.

\* Engagement and achievement motivation. Imagining and pursuing a personal vision is profoundly engaging. It's an act of self expression and an act of communicating meaning and feelings to other. Students become goal-oriented and self-directed (p. 14).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** “I think the work done here suggests a much closer connection between the cognitive processes that give rise to the arts and the cognitive processes that give rise to the sciences” (Elizabeth S. Spelke, p. 1). ... the Dana Foundation of New York City in 2004 brought together neuroscientists and cognitive psychologists from seven universities to launch a broad program of studies looking at how experience in dance, music, theater, and visual arts might spill over into other areas of learning, and to explore possible mechanisms for those links in the anatomy of the brain—even at the genetic level. “Left unsettled, experts say, is whether the arts make people smarter or whether smart people simply gravitate to the arts.” While the report still doesn’t provide any definitive answers to the arts-makes-you-smarter question, it sounds a final death knell to the myth that students are either right- or left-brained learners. It also offers hints on how



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arts learning might conceivably spill over into other academic domains. ... One way that arts learning might lead to improved thinking skills ... might be in motivation students to pay attention (p. 10). ...”What we are seeing here is that we have quantitative data that confirm our assumptions about the interrelationships in the way children learn ... And the purpose of education is to realize the full human potential of every child” (p. 11). (Viadero, D. (2008). Insights gained into arts and smarts. *Education Week*, 27, 27, 1-11.)

**2008** In 2004, the Dana Arts and Cognition Consortium brought together cognitive neuroscientists from seven universities across the United States to grapple with the question of why arts training has been associated with higher academic performance. Is it simply that smart people are drawn to “do” art—to study and perform music, dance, drama—or does early arts training cause changes in the brain that enhance other important aspects of cognition? ... Here is a summary of what the group has learned:

— -An interest in a performing art leads to a high state of *motivation* that produces the *sustained attention* necessary to improve performance and the training of attention that leads to improvement in other domains of cognition.

Although scientists must constantly warn of the need to distinguish between correlation and causation, it is important to realize that neuroscience often begins with correlations—usually, the discovery that a certain kind of brain activity works in concert with a certain kind of behavior. ... Many of the studies cited here tighten up correlations that have been noted before, thereby laying the groundwork for unearthing true causal explanations through understanding biological and brain mechanisms that may underlie those relationships.

... In my judgment, this project has identified candidate genes involved in the predisposition to the arts and has also shown that cognitive improvements can be to specific mental capacities such as geometric reasoning; that specific pathways in the brain can be identified and potentially changed during training; that sometimes it is not structural brain changes but rather changes in cognitive strategy that help solve a problem; and that early targeted music training may lead to better cognition through an as yet unknown neural mechanism. All of those findings are rather remarkable and challenging.

(Gazzaniga, M. S. (2008). Arts and cognition: Findings hint at relationships. 2008 Progress Report on Brain Research. The Dana Press. 7-12.)

**2008** Many students are engaged by arts instruction, and when students are engaged their overall motivation to learn improves.

(Guisbond, L. (2008, December 8). Art’s power to teach 21<sup>st</sup>-century skills. *The Boston Globe*. Retrieved from

<http://r.smartbrief.com/resp/nqbgryypnxvcmyCibSgfdQsO?format=standard>.)

**2007** As Richard Riley, former Secretary of Education, put it, “The arts teach young people how to learn by giving them the first step: the desire to learn” (p. 15).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2007** Studies of successful people show that persistence pays off; the arts increase persistence. Persistence derives from motivation; in arts-based schools it becomes apparent that it wasn't that students couldn't learn—it was that they wouldn't. The arts make students want to learn. What's more, students become more resilient to setbacks when they have the opportunity to learn through arts-based inquiry lessons that emphasize experimentation and learning from mistakes (p. 34).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Motivation to pursue and sustain learning is essential to achievement. Learning in the arts nurtures motivation through active engagement, boosting self-confidence and self-efficacy. These increase attendance, educational aspirations, and ownership of learning. Arts-based teaching makes learning more equitable by broadening access to understanding and ways to express meaning (p. 36).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2005** Art can be a powerful motivational tool to those who are successful. It can provide the impetus to succeed in other areas of school work .... Participating in an art activity is generally a joyful experience for a child, regardless of his academic achievement level... Peer group acceptance through artwork builds self-esteem in the child who feels accepted and important (p. 4-5).  
(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2003** The report (Critical Links) and its interpretive essays reveal some important relationships between learning in the arts and academic and social skills in the following major areas:

*Motivation.* The arts nurture motivation to learn by emphasizing active engagement, disciplined and sustained attention, persistence, and risk-taking. Participation in the arts also tends to increase attendance and students' educational aspirations (p. 16).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

**2000** It is likely that when reading instruction is integrated with arts instruction, children become more motivated to read. This could occur if (as is likely) young children find arts activities engaging. This analysis provided some support for the hypothesis that an art-reading curriculum does work to improve reading, and that such curricula are more effective than traditional reading curricula. However, this conclusion is limited by the fact that we cannot reliably generalize this result to new studies, probably because of the small number of studies combined (p. 291).  
(Burger, K. & Winner, E. (2000). Instruction in visual art: Can it help children learn to read? *Journal of Aesthetic Education*, 34, 3-4, 277-293.)

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**2000** Our first meta-analysis showed that when art instruction is not integrated with reading, such instruction has no effect on reading achievement scores, but has a moderate effect on reading readiness scores. Given that reading readiness tests are visual in nature, this finding demonstrates a near from of transfer. ... Perhaps arts instruction helps children to focus their visual attention and pay attention to form and detail, skills that may then help children on a visual kind of readiness test. Whether this heightened performance of a reading readiness test as a function of arts instruction leads to later reading achievement remains to be determined. This is an important question for future research (p. 291).

(Burger, K. & Winner, E. (2000). Instruction in visual art: Can it help children learn to read? *Journal of Aesthetic Education*, 34, 3-4, 277-293.)

## **Problem Solving**

**2008** Harland et al. (2000) suggest that art education outcomes range from the most intrinsic, such as enjoyment and personal achievement in the arts themselves, to related effects, such as the development of creativity and divergent thinking, and their extrinsic transfer to other curriculum areas. According to Bower, teaching the arts to students “has been linked to better visual thinking, problem solving, language and creativity ... by learning and practicing art, the human brain actually wires itself to make stronger connections” (p. 104).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** Because living and functioning in the world is a complex activity, students should be encouraged to participate in the process from multiple perspectives. The arts can also assist students with new ways to view and appreciate opportunities for interaction within the world around them. The arts can enable students to comprehend that there are many ways of problem solving. If one perspective does not meet a particular need for comprehension, students realize that they can approach the comprehension problem from another direction utilizing the arts (p. 21).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Compilations of more than 60 peer-reviewed independent studies published in recent years by the national Arts Education Partnership have begun to provide research-based answers to these questions. The studies identify the cognitive capacities — habits of mind and personal dispositions — that are developed as students tackle the specific challenges of an art form: the choreography and movements of a dance; the composition and performance of a piece of music; the script and acting of a drama; the design and creation of a painting or sculpture; the writing and performance of an opera. As students learn the content, processes and techniques specific to each of these art forms, they are at the same time developing and applying these capacities.

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\* Conditional reasoning. As a painting instructor once told me, “You don’t start until you have an image of where you are going.” Nor do you write a song or a play word by word. You have to have an idea or story in mind of what you want to make and be prepared to adjust it as you go along. This is conditional reasoning, proceeding by trial and error. It’s theorizing about actions, outcomes and consequences, defining and generating optional approaches and solutions to problems and conditions (p. 14-15).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** Our recent research at Project Zero, a research and development group at Harvard’s Graduate School of Education, shows that serious instruction in visual arts — and teachers of music, dance and drama suggest that these benefits extend across the arts — teaches habits of higher-order thinking that help students develop capacities to recognize the hidden roots of problems, make careful choices in ambiguous circumstances and seek and synthesize the resources necessary to solve problems in novel ways. High-quality arts education helps students develop important critical and creative thinking that is underdeveloped when schools dedicate themselves only to students’ success on tests (p. 14).

(Hetland, L. (2008). Basically, arts are basic. *School Administrator*, 65, 3, 14-15.)

**2008** The research, reported in “Studio Thinking: The Real Benefits of Visual Arts Education” by this author, shows that arts help students find important problems and persist toward their solutions. Arts teach envisioning, observing, informed risk-taking, learning from mistakes and comfort with uncertainty. They emphasize collaboration, expression, reflection and articulation of deeply held ideas (p. 14).

(Hetland, L. (2008). Basically, arts are basic. *School Administrator*, 65, 3, 14-15.)

**2007** The arts develop the courage to take risks and experiment. Pride in one’s unique contributions develops as teachers and peers positively respond to efforts. The arts create confidence in one’s ability to do original problem solving. Confidence increases willingness to take more risks and be more flexible (p. 20).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Involvement in the arts prepares students to solve future problems by encouraging risk taking, experimentation, and freedom to fail. Finding multiple solutions, trying new ideas, and capitalizing on mistakes are artistic orientations. As Aristotle observed, “Art loves chance. He who errs willingly is the artist” (p. 23).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2000** Art, for example, attracted low scores for thinking and problem-solving skills, but high scores for creativity, experimentation and imagination. Drama also registered a high number of nominations for imagination, but had proportionately fewer for creativity, although more for thinking and problem-solving skills. Dance was similarly high on

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imagination, but low on thinking and problem solving skills. Although attracting some references to thinking and problem-solving skills, music was comparatively low for creativity, experimentation, and imagination. In addition to such variations between art forms, the data suggested that the type and level of creativity outcomes varied according to differences in teacher pedagogies and course content (p. 54).

(Harland, J. (2000). What research in the United Kingdom shows about transfer from the arts. In E. Winner & L. Hetland (Ed.), *Beyond the soundbite: arts education and academic outcomes: conference proceedings from Beyond the soundbite: what the research actually shows about arts education and academic outcomes*. Los Angeles, California: The Getty Center.)

## Reading

**2008** “Champions of Change” also reports that sustained involvement in music and theater are highly correlated with success in mathematics and reading and that “the arts provide young people with authentic learning experiences that engage their minds, hearts and bodies” (p. 34).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** Readers Theater is an example of a dramatic technique used to facilitate reading instruction. Through the reenactment of a selected story, students not only became familiar with the plot, setting, characters and other story elements, but also the fluency of the story. Students who were instructed using this technique scored significantly higher on tests of reading fluency than those that did not receive instruction in this technique (p. 19).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Researchers note that literature comes to life in more exciting ways through the arts. When students use the visual arts, dramatic reenactments, and groups discussion, the text becomes more meaningful to them (p. 21).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Since the program began, students at Pateros School have increased their scores on the Washington Assessment of Student Learning. Reading scores for fourth-grade students have risen from 56 percent in 2002 to 95 percent in 2006. Seventh-grade reading scores rose from 46 percent to 61 percent, and tenth-grade scores climbed from 48 percent to 92 percent (p. 10).

(Arts education broadens horizons. (2008). *School Administrator*, 65, 9-10.)

**2008** “I think the work done here suggests a much closer connection between the cognitive processes that give rise to the arts and the cognitive processes that give rise to

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the sciences.” ... the Dana Foundation of New York City in 2004 brought together neuroscientists and cognitive psychologists from seven universities to launch a broad program of studies looking at how experience in dance, music, theater, and visual arts might spill over into other areas of learning, and to explore possible mechanisms for those links in the anatomy of the brain—even at the genetic level. Left unsettled, experts say, is whether the arts make people smarter or whether smart people simply gravitate to the arts. While the report still doesn’t provide any definitive answers to the arts-makes-you-smarter question, it sounds a final death knell to the myth that students are either right- or left-brained learners. It also offers hints on how arts learning might conceivably spill over into other academic domains. ... Students who came to the study with more musical training tended to make faster gains in reading fluency than did students with no musical backgrounds. ... “Listening carefully to other sounds has long been thought to be important to the development of phonological awareness and reading fluency” (p. 10) ... “What we are seeing here is that we have quantitative data that confirm our assumptions about the interrelationships in the way children learn ... And the purpose of education is to realize the full human potential of every child” (p. 11).

(Viadero, D. (2008). Insights gained into arts and smarts. *Education Week*, 27, 27, 1-11.)

**2008** In 2004, the Dana Arts and Cognition Consortium brought together cognitive neuroscientists from seven universities across the United States to grapple with the question of why arts training has been associated with higher academic performance. Is it simply that smart people are drawn to “do” art—to study and perform music, dance, drama—or does early arts training cause changes in the brain that enhance other important aspects of cognition? ... Here is a summary of what the group has learned:

— Correlations exist between music training and both reading acquisition and sequence learning. One of the central predictors of early literacy, phonological awareness, is correlated with both music training and the development of a specific brain pathway.

Although scientists must constantly warn of the need to distinguish between correlation and causation, it is important to realize that neuroscience often begins with correlations—usually, the discovery that a certain kind of brain activity works in concert with a certain kind of behavior. ... Many of the studies cited here tighten up correlations that have been noted before, thereby laying the groundwork for unearthing true causal explanations through understanding biological and brain mechanisms that may underlie those relationships.

... In my judgment, this project has identified candidate genes involved in the predisposition to the arts and has also shown that cognitive improvements can be to specific mental capacities such as geometric reasoning; that specific pathways in the brain can be identified and potentially changed during training; that sometimes it is not structural brain changes but rather changes in cognitive strategy that help solve a problem; and that early targeted music training may lead to better cognition through an as yet unknown neural mechanism. All of those findings are rather remarkable and challenging.

(Gazzaniga, M. S. (2008). Arts and cognition: Findings hint at relationships. 2008 Progress Report on Brain Research. The Dana Press. 7-12.)

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**2007** ... recent research suggests that the stark choice between academics and the arts is a false dichotomy. In fact, recent research suggests a direct and systematic link between art experiences and literacy skills. For example, Kennedy (2006) described a study of a Guggenheim Museum art project: “Students in the program performed better in six categories of literacy and critical thinking skills—including thorough description, hypothesizing and reasoning—than did students who were not in the program.” (p. 80) (Reeves, D. (2007). Academics and the arts. *Educational Leadership*, 80-81.)

**2007** Arts instruction enhances and complements basic reading instruction. This includes learning letter names and sounds, spelling, and phonics (p. 36). (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** The arts offer additional ways to understand and represent ideas and feelings. This includes improved language and literacy skills related to use of drama and music. For example, dramatic enactments of stories and text improve writing, reading comprehension, and ability to read materials not seen before. The effects are even more significant for children from economically disadvantaged circumstances and those with reading difficulties. Planning and organizing skills inherent in music are parallel with planning and producing writing (p. 36). (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Students at Opening Minds through the Arts (OMA) schools have significantly higher scores in math, reading, and writing than non-OMA students. The arts have closed the gap between minority and white students (p. 6).

Opening Minds Through the Arts is an arts integration project currently being implemented in the Tucson Unified School District in Arizona. The OMA® Project was developed around brain-based learning theories designed to impact at-risk children and significantly increase student achievement. The goal of OMA® is to help all students succeed by actively supporting and positively engaging students in all subjects through the arts. <http://www.ed.gov/news/av/video/edtv/2004/0503-resources.html> (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** South Carolina. Arts in Basic Curriculum (ABC) evaluators analyzed 3 years of state tests in English/Language Arts and math. They found a steady increase in the percent of students identified as proficient or advanced in ABC schools, as compared to the comparison group (p. 6). (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Hamilton, OH. Students involved in the SPECTRA arts program made more gains in reading vocabulary, comprehension, and math than a control. Creativity measures were four times higher and gains held during a second-year evaluation (p. 6).

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(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2005** The lack of pre-existing correlation makes it more likely that the kinds of skills that have been reported in children who have studied music are an outcome of music training. ... studies reported that musical tasks activate language areas and vice versa, suggesting that music and language share neural substrates. Similar associations between musical aptitude and literacy have been found by others. In addition, there are studies that have associated pitch pattern recognition with reading skills (p. 131).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2005** This publication reports case studies of ten schools that serve large percentages of at-risk students and use arts-integrated instruction to bring about student gains in various subjects, including English Language Arts. Researchers found that by tapping the innate desire to convey personal meaning, these schools have helped students to understand the importance of communication and to want actively to improve their skills in reading, speaking, and writing. Connecting learning to students' background experiences is central to this process. Specifically, the research revealed three essential connections: (1) Students learn to make connections between their own experiences and the ability and willingness to explain complex texts and to explore multiple perspectives. (2) Students come to understand the parallels between language arts and other arts forms, such as drama and visual art, in conveying similar ideas, themes, and experiences. (3) Students' understanding of the significance and power of the writing process develops their own willingness to exercise literacy skills. These findings are supported both by naturalistic data and student gains on standardized achievement tests. See especially Chapter 4: Arts, Literacy, and Communication.

(Stevenson, L. M. & Deasy, R. J. (2005). *Third space: When learning matters*. Washington, D.C.: Arts Education Partnership.)

**2004** This article explains that literacy is a complex, multilayered process for making meaning by working with various symbol systems. Each child uses those systems that are preferred or seem most natural. No system works alone; rather, all work together in a kind of inter-textual network. In the upper grades, the opportunities that are afforded to a learner to draw from experiences in one domain and apply them to another domain are critical to deep learning and understanding. Other critical issues in the upper grades include the connection of a learner's school experiences to personal identity, individual culture, and family.

(Bloome, D. (2004). What should the arts education community know about literacy? A panel representing the reading and literacy community responds. Arts Education Partnership, Forum Report: June 18-19, 2004. <http://www.aep-arts.org/ReportJune2004panel1.doc>)

**2004** This article summarizes various studies, including those in *Critical Links*, which explore connections between learning in music and drama and development in literacy



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and language. Notes that both music and language are composed of symbol systems that possess common characteristics and that both employ spatial-temporal reasoning. Highlights the role of dramatic activities in strengthening text comprehension and writing proficiency.

(Arts Education Partnership. (2004). The arts and education: New opportunities for research. <http://www.aep-arts.org/PDF%20Files/OpportunitiesResearch.pdf>.)

**2004** This article explains that literacy is a complex, multilayered process for making meaning by working with various symbol systems. Each child uses those systems that are preferred or that seem most natural. No system works alone; rather, all work together in a kind of inter-textual network. In the upper grades, the opportunities that are afforded a learner to draw from experiences in one domain and apply them to another domain are critical to deep learning and understanding. Other critical issues in the upper grades include the connection of a learner's school experiences to personal identity, individual culture, and family.

(Bloome, D. (2004). What should the arts education community know about literacy? A panel representing the reading and literacy community responds. *Arts Education Partnership, Forum Report: June 18-19, 2004*. <http://www.aep-arts.org/ReportJune2004panel1.doc>.)

**2003** This article finds that drama and theatre can increase the "social capital" of learners by improving their mastery of standard English via metacognitive strategies.

(Kempe, A. (2003). The role of drama in the teaching of speaking and listening as the basis for social capital. *Research in Drama Education*. <http://journalsonline.tandf.co.uk/media/3aa8luxhxndyyv14gp81/contributions/k/1/4/f/k14fp7egnv30gylx.pdf>.)

**2002** This article details the findings of the 1993 National Household Education Survey, which analyzed factors that affect the cognitive readiness of four-year-old preschool students. Of the preschoolers in the national sample considered at-risk, those who participated in culture-related activities tended to have higher levels of cognitive development and lower variability in cognitive readiness.

(Beasley, T.M. (2002). Influence of culture-related experiences and socio-demographic risk factors on cognitive readiness among preschoolers. *Journal of Education for Students Placed at Risk*.)

**2002** This article provides a compendium of research studies exploring the potential for transfer to occur in the context of arts learning. The most compelling evidence of opportunities for transfer—the theory that learning in one academic area can assist learning in another area—is cited in studies concerning the impact of drama on story understanding, reading comprehension and topical writing and those suggesting a relationship between music and the development of spatial reasoning abilities. Suggests that more research must be done in the areas of visual arts and dance.

(Catterall, J. (2002). The arts and the transfer of learning. *Critical links: Learning in the arts and student academic and social development*. <http://www.aep-arts.org/PDF%20Files/CriticalLinks.pdf>.)

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**2002** This publication shows how the arts can help students develop the essential understanding of metaphors, symbols, and analogies and their potential for communication of ideas.

(Efland, A. (2002). *Art and cognition*. New York: Teachers College.)

**2002** This publication explains the neurodevelopmental research of the author, who has found that students bring unique combinations of strengths and challenges to school. Understanding these differences can help teachers meet students' needs. Often children may be perplexed by what appears to be their failure to fit a "norm." Through a process he calls "demystification," Levine helps individual children to understand that each has a unique set of strengths, as well as areas where additional help is needed.

(Levine, M. (2002). *A mind at a time*. New York: Simon & Schuster.)

**2001** This publication explains that learning in the arts provides students with forms of communication that transcend or differ from literal or discursive language—including such tools as visual communication, movement and gesture, and music and sound. These "nonlinguistic representations" involve not just a change in medium but a change in mode of understanding. In other words, there are concepts and ideas that can be conveyed via pictures or gestures in a way that is not possible via words. These same researchers also confirm the importance of students' learning how to understand and use metaphor as a powerful key to learning, which helps students learn and integrate new knowledge through comparison and contrast with existing or familiar knowledge.

(Marzano, R. J., Pickering, D. J. & Pollock, J. E. (2001). *Classroom instruction that works*. Alexandria, VA: ASCD.)

## **2001 Areas Where No Reliable Causal Links Were Found**

*Learning to Play Music and Reading:* Based on 6 reports (6 effect sizes), a small relationship was found between music and reading but this relationship could not be generalized to new studies (p. 5).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

## **2001 Areas Where No Reliable Causal Links Were Found**

*Visual Arts and Reading:* Based on 5 reports in which visual arts was taught separately from reading (7 effect sizes), a very small relationship between visual arts and reading was found, but this relationship could not be generalized to new studies. This effect was entirely due to reading readiness outcomes (which are themselves visual), and did not hold up for reading achievement outcomes. Based on 4 reports in which visual arts were integrated with reading instruction (4 effect sizes), a medium sized relationship was found between integrated arts/reading instruction and reading outcomes. However, this result could not be generalized to new studies (p. 5).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

## **2001 Areas Where No Reliable Causal Links Were Found**

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*Dance and Reading*: Based on 4 reports (4 effects sizes), a small relationship between dance and reading was found, but this relationship could not be generalized to new studies (p. 5).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

**2003** According to a new and comprehensive research report, good arts programs in elementary and middle schools not only build skills needed to learn other subjects, including reading, writing, and math, but motivate students to learn—particularly those at risk of failure (p. 15).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

**2003** The report (Critical Links) and its interpretive essays reveal some important relationships between learning in the arts and academic and social skills in the following major areas:

*Reading and language.* Certain forms of arts instruction enhance and complement basic reading instruction. They help children break the phonetic code that unlocks written language by associating letters, words, and phrases with sounds, sentences, and learning. Reading comprehension, speaking, and writing skills are also improved (p. 16).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

**2003** Acting out stories—classics as well as a child's own creative inventions—enhances reading development as well as interpersonal and self-understanding (p. 17).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

**2000** This article explains that knowledge taught in multiple contexts is likely to support the transfer of learning from one domain to another. Learning to look for, recognize, and extract underlying themes and ideas can help students to understand when and under what conditions to apply their knowledge, an aspect of expertise.

(Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Research Council.)

**2000** This publication summarizes the findings of the Reviewing Education and the Arts Project (REAP) by Harvard's Project Zero. A search for all English language studies between 1950 and 1999 found that learning in the arts leads to academic improvement in other areas. Cites clear causal links demonstrated between spatial-temporal reasoning and both listening to music and learning to play music.

(Hetland, L. & Winner, E., eds. (2000). The arts and academic achievement: What the evidence shows. *The Journal of Aesthetic Education*.

<http://www.pz.harvard.edu/Research/Reap/REAPExecSum.htm>.)

**2000** Music to Reading

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Once social class and prior attainment in English were controlled for, there was no significant positive association between taking courses in music or participation in extracurricular music and GCSE performance in English. None of the pupils alluded to possible transfers from music to reading (p. 52).

(Harland, J. (2000). What research in the United Kingdom shows about transfer from the arts. In E. Winner & L. Hetland (Ed.), *Beyond the soundbite: arts education and academic outcomes: conference proceedings from Beyond the soundbite: what the research actually shows about arts education and academic outcomes*. Los Angeles, California: The Getty Center.)

## **2000 Visual Arts to Reading**

Having controlled for social class and prior attainment in English, there was a significant negative association between taking courses in art and GCSE performance in English. The pupils did not mention transfers from art to reading, but some described transfers from art to writing (e.g. observation, imagination, and presentational skills) (p. 52).

(Harland, J. (2000). What research in the United Kingdom shows about transfer from the arts. In E. Winner & L. Hetland (Ed.), *Beyond the soundbite: arts education and academic outcomes: conference proceedings from Beyond the soundbite: what the research actually shows about arts education and academic outcomes*. Los Angeles, California: The Getty Center.)

**1999** Analysis of these studies indicates that the use of creative drama to enhance the reading scores of a population of remedial or low-ability fifth graders enrolled in a compensatory program proved effective at the .05 level compared to the performance of two other groups of students using methods that did not include creative drama (Du Pont, 1992). It must be noted that the aim of the program was to increase reading performance, not to teach creative drama, and that the population was a special population of fifth graders in need of reading skills, not a population of average students. In short, given the aims of the study and the population studied, the results are limited to like populations (p. 144).

(Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

**1999** This article analyzes the National Educational Longitudinal Survey (NELS:88), a ten-year panel study following more than 25,000 students between the eighth and twelfth grades. Links sustained involvement in theatre arts by low SES youth to improvement in reading proficiency, noting that nearly 20 percent more were reading at high proficiency by the twelfth grade than were their non-theatre peers.

(Catterall, J., Chapleau, R. & Iwanaga, J. (1999). Involvement in the arts and human development: General involvement and intensive involvement in music and theatre arts. *Champions of change: The impact of the arts on learning*.

<http://www.gseis.ucla.edu/faculty/publications/100535351554386100.pdf>)

**1998** This article details the findings of a longitudinal study begun in 1988 by the U.S. Department of Education that examines the arts involvement and academic achievement of 25,000 secondary school students. Overall, high-arts students at the eighth and tenth

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grade levels showed higher performance in English and reading than their low-arts peers. Similarly, students coming from low SES (socio-economic status) families that maintained higher levels of arts involvement were almost twice as likely to score in the top two quartiles in reading as students from low SES families with little arts involvement.

(Catterall, J. (1998). Involvement in the arts and success in secondary school. *Americans for the Arts Monographs* January. <http://pubs.artsusa.org/library/ARTS042/html/1.html>.)

**1998** This article examines how community youth programs that specialize in the arts can encourage the development of literacy skills for at-risk children and teenagers. Stresses the fundamental role language plays in the translation and critique of art and art making, as well as the frequent opportunities for the use of language that reflects critical judgment and systematic reasoning.

(Heath, S., Roach, A. & Soep, E. (1998). Living the arts through language and learning: A report on community-based youth organizations. *Americans for the Arts Monographs*. <http://pubs.artsusa.org/library/ARTS048/html/1.html>.)

**1996** This article cites various studies detailed in the 1995 publication *Spin-Offs*. Studies explore the relationship between the study of music and learning in nonmusical areas of the curriculum. Included is a 1976 study in which first graders who participated in a classical music listening program were shown to have scored higher in discrimination sections of reading and language arts tests.

(Nierman, G. (1996). Music instruction and language skill development. *Nebraska Music Educator*. <http://www.menc.org/networks/genmus/litarticles.html>.)

## School Attendance

**2007** Increasingly the arts are becoming leading contenders in school reform ... For example, daily attendance increased up to 94 percent, and 83 percent of students achieved at or above national norms in reading and math after the arts were integrated into the curriculum at Guggenheim Elementary School in inner-city Chicago (p. 14).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** According to Welch (1995), arts programs are related to dropout prevention. Programs such as the Duke Ellington School's in Washington, D.C., are examples using the arts to motivate students: Ninety percent of the participants in the Boys Choir of Harlem go on to college (p. 22).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Students stay in school longer and have more positive attitudes (p. 36).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2007** Arts-based education also boosts school attendance and communication skills. The arts contribute to lower recidivism rates, increased self-esteem, and the acquisition of job skills, especially for at-risk populations. The arts give students an understanding of the skill, discipline, perseverance, and sacrifice necessary for achievement in the workplace and in personal life (p. 24).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

## ***School Environment***

**2008** Benefits of arts programs:

- Promotes the concept that teachers are facilitators of learning and not dispensers of knowledge
- Allows students to more deeply understand by doing and becoming more involved in the learning process
- Provides additional entry points for content discussion and discovery
- Expands curriculum to other cultures of the world
- Reinforces aesthetic qualities of students
- Promotes visualization of the content and promotes imagination
- Encourages multi-sensory approaches to teaching and learning
- Engages intrapersonal and interpersonal communication
- Encourages collaborative work by students (and, at times, teachers)
- Infusion of the arts into the curriculum may be accomplished in a variety of ways
- Improves spatial and logical mathematical reasoning
- Encourages risk-taking by students expressing creativity
- Enhances communication skills of students
- Is adaptable to all areas of the curriculum
- Provides an avenue to encourage diversity/multiculturalism (p. 23-24).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** The Arts Education Partnership explored this potential impact of arts education in a three-year study of 10 high-poverty, high-performing schools.... The crucial and seminal finding is that the arts created positive and empowering learning environments in classrooms and in the school. These environments emerged as the result of new sets of relationships the arts fostered between and among students and teachers. ... The key to the shift in relationships were teacher attitudes toward the art works produced by students, seeing them primarily as expressive communications of matters personally meaningful to students and, therefore, to be read for insights into how to motivate and guide the students' academic, personal and social development. ... Encouraged by teachers to be both imaginative and progressively more competent in their use of the

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techniques of an art form, students matured both individually and as a community of learners. This represents the arc of development that cognitive scientists such as John Bransford and his colleagues describe as leading to “adaptive expertise,” the ability to apply what you learn in new settings and conditions, a fundamental goal of schooling (p. 17).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2007** Wilmington, NC. Student disciplinary actions dropped from 130 to 50 and suspensions from 32 to 3 during the first year of involvement in the A+ School Program of arts integration (p. 10).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** The arts create a sense of belonging based on delight and respect for each person’s distinctive contributions. Experiences as audience members and as performers connect students in reciprocal relationships. As concertgoers and museum visitors they are bound together in listening and viewing experiences that create shared background. They experience the dependent relationships of arts consumers and producers that builds a sense of community (p. 19).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Research studies also link arts-based education to a positive school environment. The arts transform classrooms, and schools become places of discovery. The culture is changed, conditions for learning improve, and there is more collaboration among teachers and integration of disciplines (p. 22).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** It is critical that students learn in a positive context. The arts help create the kind of learning environment that boosts success by “fostering teacher innovation, a positive professional culture, community engagement, increased student attendance and retention, effective instructional practice, and school identity” (p. 37).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** The arts enhance learning by creating “strong school ecologies.” A “Complex web of stimulation and influence creates an enhanced learning environment [which is] key to academic achievement.” The arts-infused environment increases opportunities for engaged, active, interdisciplinary teaching and learning (p. 37).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** The arts promote a greater spirit of cooperation and participation. Teachers work more collaboratively and are more creative, artistic, and enthusiastic. They think more

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deeply and are more open and flexible. Teachers involved in arts integration are more likely to participate in professional development and acquire a broader repertoire of teaching strategies (p. 37).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** A 3-year study of more than 6,000 elementary students in Learning to Read Through the Arts showed an 11 point increase in math in the 170 schools. Literacy scores remained the same, but students reported being happier about school and researchers saw them as more engaged (p. 10).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2003** The report (Critical Links) and its interpretive essays reveal some important relationships between learning in the arts and academic and social skills in the following major areas:

*School environment.* The arts help to create the kind of learning environment that is conducive to teacher and student success by fostering teacher innovation, a positive professional culture, community engagement, increased student attendance, effective instructional practice, and school identity (p. 16).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

**2003** Scripp also notes the positive effects of calming background music on student behavior and concentration in classrooms, on school buses, and during tests (p. 17).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

## Social and Emotional Competence

**2008** In *More Than Words Can Say*, Joan Livermore argues that the arts can facilitate personal and social development. Learning in other curriculum areas and the development of a range of skills and understandings that can be applied in vocational and other life situations. Studies including *Champions of Change* (Fiske, 1999) *Reviewing Education and the Arts Project* (Project Zero, Hetland & Winner, 2001) and *Critical Links* (Deasy, 2002) have indicated that important cognitive and social processes and capabilities are developed in and through arts-learning experiences (p. 104).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** ... arts programs can enhance students' potential to engage with school and learning. The following 'enabling' skills and attitudes were noted: students' self esteem was increased; students were better able to work cooperatively with others; and students were able to plan and set goals (p. 107).



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(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** The arts also were viewed as instrumental in enhancing student communication while increasing student ability to interact and to reflect (p. 16-17).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Benefits of arts programs:

- Engages intrapersonal and interpersonal communication
- Enhances communication skills of students (p. 23-24).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** The habits of mind and dispositions discussed above were developing, and there were also strong and significant personal and social effects. These effects speak directly to the public concerns and beliefs that schools must prepare students not just for economic roles but for family life and citizenship. Three of those effects were rated of great importance by focus groups and in polling and seen as advanced by the arts. Drama is particularly effective at developing the first two. All of the arts, well taught, nurture the third.

- \* Empathy: understanding another's feelings and point of view;
- \* Social tolerance: respecting multiple values and perspectives;
- \* Self-esteem and self-efficacy: realistically valuing oneself and the impact of one's actions against a set of internalized standards and believing you can make a difference (p. 17).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** Subsequent research identified a range of positive social impacts that art has, including:

- Health and well-being
- Learning
- Development and identity
- Attitude and behavior
- Ideology and diversity
- Social inclusion (p. 21).

(White, R. W. & Hede, A.M. (2008). Using narrative inquiry to explore the impact of art on individuals. *The Journal of Arts Management, Law, and Society*, 38, 1, 19-3\_.)

**2008** In 2004, the Dana Arts and Cognition Consortium brought together cognitive neuroscientists from seven universities across the United States to grapple with the question of why arts training has been associated with higher academic performance. Is it simply that smart people are drawn to “do” art—to study and perform music, dance,

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drama—or does early arts training cause changes in the brain that enhance other important aspects of cognition? ... Here is a summary of what the group has learned:

— Adult self-reported interest in aesthetics is related to a temperamental factor of openness, which in turn is influenced by dopamine-related genes.

Although scientists must constantly warn of the need to distinguish between correlation and causation, it is important to realize that neuroscience often begins with correlations—usually, the discovery that a certain kind of brain activity works in concert with a certain kind of behavior. ... Many of the studies cited here tighten up correlations that have been noted before, thereby laying the groundwork for unearthing true causal explanations through understanding biological and brain mechanisms that may underlie those relationships.

... In my judgment, this project has identified candidate genes involved in the predisposition to the arts and has also shown that cognitive improvements can be to specific mental capacities such as geometric reasoning; that specific pathways in the brain can be identified and potentially changed during training; that sometimes it is not structural brain changes but rather changes in cognitive strategy that help solve a problem; and that early targeted music training may lead to better cognition through an as yet unknown neural mechanism. All of those findings are rather remarkable and challenging.

(Gazzaniga, M. S. (2008). Arts and cognition: Findings hint at relationships. 2008 Progress Report on Brain Research. The Dana Press. 7-12.)

**2007** Visual images, left open to interpretation, cause fine art, and even decorative art, to engage us cognitively and emotionally and may even stimulate a physical response (p. 7). (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Compassion means to be in passion with another. The arts develop concern for, sensitivity to, and “response ability.” The arts build empathy through experiences that cause students to grasp another’s understanding. The arts intentionally invite empathy by their emphasis on and respect for the unusual, different, and extraordinary. Like respect, empathy comes from acknowledging the circumstances of another person and leads to compassion when one person fully imagines himself in those circumstances (p. 19). (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Student testimonials also point to how the arts can be a feel-good alternative to drugs and other destructive means to “get high.” In addition, the arts contribute to increased self-esteem and the development of creative problem-solving skills that build independence and lower recidivism rates (p. 15). (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** 1. *Self-esteem, flexibility, and willingness to take risks, experiment, and tolerate uncertainty increases.* ... 3. *Empathy for others increased.* Drama, in particular, was found to show this effect. Stereotypical views toward minority cultures decreased when

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arts instruction focused on Native American music and culture (p. 36).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** Studies of arts-based learning experiences in drama, music, dance, and multiarts activities show student growth in self-control, conflict resolution, collaboration, empathy, and social tolerance.

1. *Quality of classroom participation increased.* Students involved as makers and doers in the arts showed the greatest ability to collaborate, reflect, and make choices.
2. *Self-discipline/regulation increased.* Students were more cooperative, paid attention, persevered, did more problem solving, took initiative, asked questions, took positive risks, used feedback, and prepared. Greater communication skills developed through the arts enhanced ability to achieve consensus.
3. *The arts make education more equitable.* The arts are “instruments of cognitive growth and agents of motivation,” so unfair access to the arts “brings consequences of major importance to our society.” The National Assessment of Educational Progress (NAEP) data demonstrates how the arts can level the educational playing field. For example, among all areas in which students were tested, music scores reflected the narrowest gap between varying races and minorities.
4. *Arts-based instruction can increase family and community support.* Dramatic increases were found in “Syntactic complexity, hypothetical reasoning, and questioning approaches” that enable planning and give youth “language with which to collaborate productively and respectfully,” allowing them to participate in social enterprises to improve their communities (p. 36).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** The arts are crucial to young children’s understanding and often are the only ways they can express feelings and ideas (p. 18).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2006** This publication examines how participation in the arts impacts student achievement, citing examples from national programs in which arts learning was linked to the development of cognitive and social skills. In one case, learning to play the guitar and perform in front of peers was shown to bolster the confidence and self-esteem of a group of 8- to 19-year-old boys living in residential homes and juvenile detention centers. Similarly, a group of juvenile offenders between the ages of 13 and 17 who participated in jazz and hip-hop dance classes reported marked increases in confidence levels.  
(Ruppert, S. (2006). *Critical evidence: How the arts benefit student achievement*.)

**2005** Arts participation and self-esteem: In looking at the data made available in small research studies, Esker Kent concluded that:

Thus we have created a cycle – art allows us to give vent to our creative urges; our creativity brings about self-esteem; our improved self-concept assists in the breaking down

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of our inhibitions so that we can more readily communicate through art or other modes of expression.

Teacher observation data concluded that there were ‘observed changes in the attitudes of some of the students that participated in the integrated arts classes’. ... ‘troublesome students were turned round by the experience and became very different – ‘the kind of experience that may not always show up as a statistic’ (p. 3).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** ‘Education in the arts provides students with experiences that broaden their interests, pique their curiosity, and afford opportunities for self-expression (p. 4).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** In *Arts in their View: a Study of Youth Participation in the Arts* Harland, Kinder and Hartley report that the ‘arts effects’ evidenced include increases in self-esteem and confidence, as well as enhancement of thinking, organizational skill and other cognitive skills. ... one of the noticed effects on pupils in schools with a good reputation for high-quality creative arts learning situations was a heightened sense of fulfillment and advances in personal development (p. 7).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2004** In terms of social inclusion, arts outcomes appear to be strongly associated with the therapeutic outcomes of enjoyment, psychological wellbeing, and also interpersonal skills/relationship development along with increased awareness of cultural and moral issues. Engaging in arts as part of constructive leisure, at its simplest, negates what criminologists call the ‘hang-factor’—the pull towards engaging in antisocial acts due to lack of opportunities or other purposeful activity (p. 53).

(Kinder, K. & Harland, J. (2004). The arts and social inclusion: What’s the evidence? *Support for Learning*, 19, 2, 52-56.)

**2003** The report (Critical Links) and its interpretive essays reveal some important relationships between learning in the arts and academic and social skills in the following major areas:

*Social Behavior.* Certain arts activities promote growth in such positive behavioral qualities as self-confidence, self-control, self-identity, conflict resolution, collaboration, empathy, and social tolerance (p. 16).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don’t axe the arts! *Principal*, 14-18.)

**2003** Acting out stories—classics as well as a child’s own creative inventions—enhances reading development as well as interpersonal and self-understanding (p. 17). (Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don’t axe the arts! *Principal*, 14-18.)

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**1998** Studies indicate that creative drama can serve to remediate difficulties in social and language skills (p. 89). ... children with LD (learning disabilities) can improve and maintain social and oral expressive language (speaking) skills through drama. ... Creative drama basically entails self-expressive, social interactions which emphasize speaking spontaneously in improvisations, thereby leading to better interpersonal communication skills (p. 93).

(de la Cruz, R. E., Lian, M.G.J., Morreau, L. E. (1998). The effects of creative drama on social and oral language skills of children with learning disabilities. *Youth Theatre Journal*, 12, 89-95.)

**1998** Creative drama should be used on an ongoing basis as part of the total program for the development of social skills and oral language (p. 93). ... creative drama will not only contribute to a more balanced curriculum for children's general development but will also enhance specific language and social skills (p. 94).

(de la Cruz, R. E., Lian, M.G.J., Morreau, L. E. (1998). The effects of creative drama on social and oral language skills of children with learning disabilities. *Youth Theatre Journal*, 12, 89-95.)

## ***Spatial Thinking***

**2008** Arts education not only provides artistic training, but teaches children creativity, spatial thinking and abstract reasoning, all critical skill sets for tomorrow's software designers, scientists, entrepreneurs and engineers (p. 27).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** Besides the relationship between spatial and logical mathematical intelligences, there is also a strong relationship between spatial and musical intelligences. Hetland (2000) explored the Mozart Effect to determine the specific connections between these two intelligences. She stated that the Mozart Effect resulted in the ability of students to visually rotate a picture or symbol of an object. Hetland's research supported other findings that this effect was not limited exclusively to Mozart but other composers as well. However, not all types of music enhanced this effect. The particular properties of music that enhanced the spatial skills of participants in this study are still being explored (p. 17).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Benefits of arts programs:

- Improves spatial and logical mathematical reasoning (p. 23-24)

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

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**2008** “I think the work done here suggests a much closer connection between the cognitive processes that give rise to the arts and the cognitive processes that give rise to the sciences” (Elizabeth S. Spelke, p. 1). ... the Dana Foundation of New York City in 2004 brought together neuroscientists and cognitive psychologists from seven universities to launch a broad program of studies looking at how experience in dance, music, theater, and visual arts might spill over into other areas of learning, and to explore possible mechanisms for those links in the anatomy of the brain—even at the genetic level. Left unsettled, experts say, is whether the arts make people smarter or whether smart people simply gravitate to the arts. While the report still doesn’t provide any definitive answers to the arts-makes-you-smarter question, it sounds a final death knell to the myth that students are either right- or left-brained learners. It also offers hints on how arts learning might conceivably spill over into other academic domains (p. 10). ...Spatial skills and other nonverbal IQ skills did improve in the music students over the course of the eight-week study, but that was also true for the children who got attention training and the Head Start children who worked in small groups. Only the children in the large Head Start class failed to make any progress in those areas. “What we are seeing here is that we have quantitative data that confirm our assumptions about the interrelationships in the way children learn ... And the purpose of education is to realize the full human potential of every child” (p. 11).

(Viadero, D. (2008). Insights gained into arts and smarts. *Education Week*, 27, 27, 1-11.)

**2007** *Spatial reasoning, organization, planning. Self-direction and self-assessment improve.* Music, in particular, has been found to enhance spatial thinking (p. 36). (Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2005** In *Arts and Academic Achievement: What the Evidence Shows* Hetland and Winner (2001) examine reported correlations between arts education and academic achievement. They found three areas where clear causal links could be made:

1. Between listening to music and improved temporal-spatial performance.
2. Between playing music and spatial reasoning.
3. Between classroom drama and improved verbal skills (p. 8).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** Musical performance demands complex cognitive and motor operations. Musicians must translate music notation (visual-spatial-temporal information) into precisely timed sequential finger movements involving coordination of both hands, recall long passages, bring meaning to music through the use of dynamics and articulation, transpose pieces to new keys, and improvise melodies and harmonies based on existing musical pieces. Some musicians are also able to identify pitches without the use of a reference tone (absolute pitch). Studies have explored the brain bases of these exceptional and highly specialized sensorimotor skills, and auditory-spatial skills. These studies have shown that in musicians certain regions of the brain are larger or have more gray matter volume (when compared to non-musicians)....These differences are even greater among musicians who began musical training at an early age. Similarly, differences between musicians and non-

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musicians correlate with intensity of musical training throughout life (p. 125).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2005** Previous research has demonstrated that music training enhances visual-spatial abilities in young children. Music training appears to enhance performance on the WISC-III Object Assembly, a task that requires mental rotation, but has no effect on Raven's Progressive Matrices, a task considered non-spatial. The ability to copy geometric forms which requires coordination between visual perception and motor planning, has also been found to be enhanced by music training (p. 125).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2005** Studies have also shown that music training can have positive effects on motor skills. The tapping rate of both the right and the left index fingers was shown to be faster in musicians than in non-musicians, and the tapping rate of the non-dominant hand was found to increase with training. This higher tapping rate in keyboard players also correlated with a greater intrasulcal length of the posterior precentral gyrus (a gross marker of primary motor cortex size). Taken together, the research suggests that music training may have positive effects on spatial, mathematical, verbal, and motoric ability (p. 126).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2004** This publication summarizes various studies, including those in *Critical Links*, that explore connections between learning in music and the development of spatial-temporal reasoning skills. Notes that mathematics and language are composed of symbol systems that possess common characteristics and that both employ spatial-temporal reasoning. (Arts Education Partnership. (2004). The arts and education: New opportunities for research. <http://www.aep-arts.org/PDF%20Files/OpportunitiesResearch.pdf>)

**2003** ... music and math both foster spatial reasoning, the ability to mentally sequence and organize concepts (p. 17).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

**2002** This publication provides a compendium of research studies exploring the potential for transfer to occur in the context of arts learning. Compelling evidence of opportunities for transfer—the theory that learning in one academic area can assist learning in another area—is found in studies involving the relationship of music to the development of spatial reasoning abilities. Suggests that more research must be done in the areas of visual arts and dance.

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(Catterall, J. (2002). The arts and the transfer of learning. *Critical links: Learning in the arts and student academic and social development*. <http://www.aep-arts.org/PDF%20Files/CriticalLinks.pdf>)

## **2001 Areas Where Reliable Causal Links Were Found**

*Listening to Music and Spatial-Temporal Reasoning:* Based on 26 reports (36 effect sizes), a medium-sized causal relationship was found between listening to music and temporary improvement in spatial-temporal reasoning. However, there was wide variation in the studies, with some showing the effect clearly and many not showing the effect at all. Moreover, the existing research does not reveal conclusively why listening to music affects spatial-temporal thinking. For education, such a finding has little importance, since it is temporary and not consistently found. Scientifically, however, this finding is of interest because it suggests that music and spatial reasoning are related psychologically (i.e., they may rely on some of the same underlying skills) and perhaps neurologically as well (i.e. they may rely on some of the same, or proximal, brain areas). Further research is needed to understand the mechanism by which certain types of music influence spatial skills (p. 4).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

## **2001 Areas Where Reliable Causal Links Were Found**

*Learning to Play Music and Spatial Reasoning:* Based on 19 reports (29 effect sizes), a large causal relationship was found between learning to make music and spatial-temporal reasoning. The effect was greater when standard music notation was learned as well, but even without notation the effect was large. The value for education is greater here, since the effect works equally for both general and at risk populations, costs little since it is based on standard music curricula, and influences many students (69 of every 100, 3-to-12 year old students). Of course we must still determine the value of improved spatial skills for success in school. Spatial skills might or might not be of benefit to students, depending on how subjects are taught. For example, mathematics or geography might be taught spatially, and if they are, then students with strong spatial abilities should have an advantage in these subjects. Sadly, many schools offer few chances to apply spatial abilities (p. 4).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

**2001** In a quantitative synthesis of 188 studies, Winner and Hetland found few causal relationships between learning in the arts and improved academic achievement in other areas. The researchers discovered slight effects in some specific areas, such as a link between listening to music and improved spatial reasoning. But they caution educators not to 'get brainwashed by today's testing mentality' and not to claim that arts programs will raise kids test scores. Such unwarranted assumptions, they say, could cause the arts—dance and all—to be written out of the curriculum (p. 32).

(Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)



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**2000** Active instruction in music does appear to enhance spatial-temporal performance for preschool and elementary-aged children, at least while instruction is occurring and at least up through two years of instruction (p. 220).

(Hetland, L. (2000). Learning to make music enhances spatial reasoning. *Journal of Aesthetic Education*, 34, 3-4, 179-227.)

**2000** The “rhythm” theory received some direct support from the Parente and O’Malley study. The hypothesis of that study, that training students in the rudiments of rhythm by playing snare drums and clapping in accompaniment to piano music would enhance performance on the Embedded Figures Test, was supported ( $r=.45$ ). Kodaly- and Orff-based programs, which enhanced spatial-temporal tasks, also emphasize the rhythmic element of music (p. 221-222).

The present results also provide some empirical support for the near transfer theory, which predicts that music might enhance other nonspatial temporal spatial processes that require spatial recognition, spatial memory, mental rotation, and/or spatial visualization as defined by Linn and Peterson. ... Clearly, further research is necessary to determine whether music instruction develops several kinds of spatial skill or only spatial-temporal ones (p. 222).

Some support was also found for the view that music instruction at younger ages is more likely to result in spatial outcomes. ... Some support was also found for the prediction that stronger learning of music should result in greater transfer. The contrast performed on studies using individual vs. group lessons showed that those with individual lessons resulted in larger effect sizes (presumably because more learning occurs in one-on-one lessons.) (p. 222).

Cautions: While the results apply to a wide-range of music programs, they do not apply to all. ... The studies included in this analysis did not allow me to determine whether or how long effects last after instruction is concluded, and some evidence suggests that they may not persist. ... It is possible that music simply speeds up a universal developmental process in spatial ability, rather than providing a lasting advantage. .... These results suggest that many kinds of musical instruction lead to spatial learning, and that type of instruction is not limited to any particular program element, musical style, or instructional practice. ... Learning standard notation (at least in combination with piano) further facilitates performance of spatial-temporal tasks (p. 223-224).

(Hetland, L. (2000). Learning to make music enhances spatial reasoning. *Journal of Aesthetic Education*, 34, 3-4, 179-227.)

## **Student Behavior**

**2007** Increased communication leads to other effects. Students are more cooperative, have greater rapport with teachers, show more sustained focus, and are more willing to perform and exhibit learning (p. 36).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

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**2007** Fewer at-risk behaviors were found. In particular, students involved in music showed this pattern. (New American Schools, 2003) (p. 36).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** 2. *Self-discipline/regulation increased*. Students were more cooperative, paid attention, persevered, did more problem solving, took initiative, asked questions, took positive risks, used feedback, and prepared. Greater communication skills developed through the arts enhanced ability to achieve consensus (p. 36).  
(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

## Verbal Skills

**2008** Harland et al. (2000) suggest that art education outcomes range from the most intrinsic, such as enjoyment and personal achievement in the arts themselves, to related effects, such as the development of creativity and divergent thinking, and their extrinsic transfer to other curriculum areas. According to Bower, teaching the arts to students has been linked to better visual thinking, problem solving, language and creativity ... by learning and practicing art, the human brain actually wires itself to make stronger connections (p. 104).  
(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2005** In *Arts and Academic Achievement: What the Evidence Shows* Hetland and Winner (2001) examine reported correlations between arts education and academic achievement. They found three areas where clear causal links could be made:

1. Between listening to music and improved temporal-spatial performance.
2. Between playing music and spatial reasoning.
3. Between classroom drama and improved verbal skills (p. 8).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2005** Studies have also shown that music training can have positive effects on motor skills. The tapping rate of both the right and the left index fingers was shown to be faster in musicians than in non-musicians, and the tapping rate of the non-dominant hand was found to increase with training. This higher tapping rate in keyboard players also correlated with a greater intrasulcal length of the posterior precentral gyrus (a gross marker of primary motor cortex size). Taken together, the research suggests that music training may have positive effects on spatial, mathematical, verbal, and motoric ability (p. 126).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there

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pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

**2005** The lack of pre-existing correlation makes it more likely that the kinds of skills that have been reported in children who have studied music are an outcome of music training. ... Studies reported that musical tasks activate language areas and vice versa, suggesting that music and language share neural substrates. Similar associations between musical aptitude and literacy have been found by others. In addition, there are studies that have associated pitch pattern recognition with reading skills (p. 131).

(Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain and Cognition*, 59, 124-134.)

## **2001 Areas Where Reliable Causal Links Were Found**

*Classroom Drama and Verbal Skills:* Based on 80 reports (107 effect sizes), a causal link was found between classroom drama (enacting texts) and a variety of verbal areas. Most were of medium size (oral understanding/recall of stories, reading readiness, reading achievement, oral language, writing), one was large (written understanding/recall of stories), and one was small and could not be generalized to new studies (vocabulary). In all cases, students who enacted texts were compared to students who read the same texts but did not enact them. Drama not only helped children's verbal skills with respect to the texts enacted; it also helped children's verbal skills when applied to new, non-enacted texts. Thus, drama helps to build verbal skills that transfer to new materials. Such an effect has great value for education: verbal skill is highly valued, adding such drama techniques costs little in terms of effort or expense, and a high proportion of students are influenced by such curricular changes (p. 4).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5. 3-6.)

## **2000 Verbal Skills Through Drama**

Once social class and prior attainment in English were controlled for, there was no significant positive association between taking courses in drama or participation in extra curricular drama and GCSE performance in English. However, in the qualitative testimonies, pupils volunteered accounts of gains in interactive communication skills, language development and expressive skills ... Drama helped a lot with work-experience interviews—speaking to people in a friendly manner, not being too frightened of questions .... (year ten, drama) (p. 52).

(Harland, J. (2000). What research in the United Kingdom shows about transfer from the arts. In E. Winner & L. Hetland (Ed.), *Beyond the soundbite: arts education and academic outcomes: conference proceedings from Beyond the soundbite: what the research actually shows about arts education and academic outcomes*. Los Angeles, California: The Getty Center.)

**1998** Studies indicate that creative drama can serve to remediate difficulties in social and language skills (p. 89). ... children with LD (learning disabilities) can improve and maintain social and oral expressive language (speaking) skills through drama. ... Creative

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drama basically entails self-expressive, social interactions which emphasize speaking spontaneously in improvisations, thereby leading to better interpersonal communication skills (p. 93).

(de la Cruz, R. E., Lian, M.G.J., Morreau, L. E. (1998). The effects of creative drama on social and oral language skills of children with learning disabilities. *Youth Theatre Journal*, 12, 89-95.)

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## Best Practices

**2008** What's a superintendent who's convinced arts do matter to do?

- \* Hire certified arts specialists. There is no substitute for sequential, standards-based curricula in the four art forms.
- \* Require arts for all students, preschool through high school. The purpose of arts education is not just to develop artists, although that is a happy outcome for some. Rather, instruction should help all students develop capacity to see the world through artistic lenses, when that is useful, just as they learn to use the lenses of mathematics, history, language arts and sciences.
- \* Team with arts partners. Supplementing regular arts instruction with collaborative planning and teaching with local artists and/or partners from arts organizations and museums in the community expands students' and teachers' approaches to artistic thinking so they can use art better across social and academic contexts.
- \* Spend professional development funds on arts training for general faculty. All teachers, and especially those in elementary grades, need to supplement subject-matter expertise with arts approaches. They can do so over time by participating regularly in art-making experiences and collaborating with school art faculty and teaching artists to reflect on possibilities for arts-infusion that supports their curricular goals.
- \* Build professional learning communities. Set up regular study groups to develop curriculum. Groups need to mix art teachers with cross-grade, non-arts subject teachers, identify shared questions and relevant readings, and plan ways to learn about them together. Administrators need to support ongoing progress on these plans and set up cross-group discussions at regular intervals.
- \* Try to lengthen the school day. Arts don't compete for time with general learning — they support it. More time in school offers more opportunities to pursue the full range of approaches to learning.
- \* Get supervisors into schools and boardrooms. They'll learn from practitioners about effective approaches and areas of need for professional support and build bridges of understanding to those who make policy. When supervisors talk only among themselves, their potential benefits to the system are largely neutralized (p. 15).

(Hetland, L. (2008). Basically, arts are basic. *School Administrator*, 65, 3, 14-15.)

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**2008** To effectively prepare students for the new workplace, schools must consider investing in their own creative workforce. Students throughout their preK-12 academic career will need access to the knowledge and skills in the arts that only specialists in music, theatre, visual arts and dance can provide. The presence of trained arts specialists not only ensures sustained and quality student engagement in various artistic disciplines, but also promotes collaboration with classroom teachers to draw connections between the arts and other subject areas. America's nonprofit arts industries, including your local arts commissions, museums and visual or performing arts centers, can be important partners for school leaders (p. 27-28).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** For the arts to effect learning, however, their presence in the schools must be meaningful. Arts specialists must be present and respected by their colleagues; sequential and grade-level appropriate instruction and learning in all artistic disciplines must be comprehensive; potential community arts partnerships must be sought and utilized; and the arts must be incorporated into the educational mission (p. 28).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** In Eisner's opinion, the arts should make a difference both in school environments of students as well as in their environments beyond school. He proposed the following outcomes in a statement describing effective art programs:

1. Students should acquire a feel for what it means to transform their ideas, images, and feelings into an art form;
2. Arts education should refine the student's awareness of the aesthetic qualities in art and life; and,
3. Arts education should enable students to understand that there is a connection between the content and the form that the arts display and the culture and time in which the work was created (p. 15).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** I wish to identify a particularly important [fourth] ... outcome for arts education:

- A willingness to imagine possibilities that are not now, but which might become;
- A desire to explore ambiguity, to be willing to forestall premature closure in pursuing resolutions; and,
- The ability to recognize and accept the multiple perspectives and resolutions that work in the arts celebrate (p. 15).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Arts projects should be an extension of student understanding of the curriculum content, not merely a 'color sheet' for early finishers (p. 16).

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(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** It was essential that art teachers and content teachers be given time to plan together to ensure that the integration of the arts into the classroom was successful and meaningful for students (p. 16).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2007** If the arts are to have the opportunity to affect our children as they did me, they must be presented to children in at least one of two places: early education, where kids are just getting some sense of what the world is; and—probably most crucially—at puberty, when a child is coming into his or her own individuality and separating himself or herself from the family (p. 14).

(Gioia, D. (2007). Pleasure, beauty, and wonder: The role of the arts in liberal education. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 11-16). Washington, D.C.: Thomas B. Fordham Institute.)

**2007** Now consider a demographically comparable district that pursues a different course. Let's call it the "unorthodox district." Instead of teaching trivial stories and having students endlessly practice comprehension strategies, the district mandates that extensive time during the literacy block shall be spent on specified topics in literature, science, history, and the fine arts. Because the listening skills of young children far exceed their reading skills, these subjects would be taught in the earliest grades through texts that are read aloud and discussed. Several weeks will be spent reading and discussing a particular domain, building up relevant knowledge and vocabulary for all students, and thereby narrowing the knowledge gap between advantaged and disadvantaged students (p. 20).

(Hirsch Jr., E. D. (2007). What do they know of reading who only reading know? Bringing liberal arts into the wasteland of the "literacy block". In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 17-24). Washington, D.C.: Thomas B. Fordham Institute.)

**2006** The best programs

- \* Draw on the artistic resources of their communities, building sustained partnerships between schools and arts organizations and between teachers and artists
- \* View student achievement and school improvement as pivotal to their mission—they are not only about advancing arts education.
- \* Engage artists, arts specialists, and teachers from all disciplines in serious inquiry about making powerful pedagogical and curricular links between the arts and other subjects.
- \* Use the arts as media to communicate content and as methods of learning through such practices as careful observation, inquiry, practice, creation, representation, performance, critique, and reflection.

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- \* Do not look the same in every school, but reflect each school's particular strengths, interests, and available arts resources.
- \* Provide arts instruction both within the context of other subjects and as a subject in its own right.
- \* Raise funds from outside the school system to support their arts integration work, while persistently seeking higher levels of commitment from schools and districts (p. 64).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2004** Indeed, the importance of arts experiences being relevant to—and reflecting— young people's lives, interests and culture has been identified as crucial to effective arts practices (p. 53).

(Kinder, K. & Harland, J. (2004). The arts and social inclusion: What's the evidence? *Support for Learning*, 19, 2, 52-56.)

**2004** Key factors associated with effective teaching and learning in the arts were identified. Bearing these in mind may thus not only raise the quality of arts education, but also help some of our young people to re-engage with learning—or indeed not become disaffected in the first place (p. 54). The key factors were:

- *The status of arts subjects in the National Curriculum:* Although the arts are not deemed to be 'core' subjects, art and music are established foundations subjects; drama and dance have a more peripheral status, thus implying they are even less important than art and music. The recommendation for the four art forms to have comparable status is made: particularly as each art form was found to offer its own distinctive type of outcomes (p. 54).
- *Enjoyment and perceived relevance of the arts:* where there was evidence of teachers mediating the curriculum so that pupils experience the arts as relevant and engaging, greater uptake and higher numbers of effects also occurred.
- *Internal and external support for the arts and arts teachers*
- *Specialist arts teachers:* Generally speaking the research found that, as far as the arts were concerned, individual teacher factors were probably more important determinants of effective arts education than whole-school factors. School staff perceived a need for specialist arts teachers, and all the lessons identified as demonstrating 'effective practice' were taught by specialist teachers with high levels of personal involvement, passion and commitment to the art form.
- *A praise culture:* effective teachers provided a highly supportive and affirming classroom environment in which pupils felt encouraged and safe to take creative risks. The perceptions of many pupils were also that an effective lesson offered a challenging activity, but one through which they could also develop some sense of achievement.
- *Practical task-based activities:* effective arts lessons were often perceived to depend on the extent of practical 'doing' activities. Pupils recounted their enjoyment of learning through 'doing their own thing', and the personal



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satisfaction they gained from being creative, developing ideas and producing their own individual outcome.

- *Performance, display, evaluation and symbolic 'celebration' of what is produced:* These were deemed to be crucial to effective arts lesson. They provided an opportunity for pupils to demonstrate what they had developed, learnt and achieved (p. 55).
- *Pupils' own contribution* (p. 56).

(Kinder, K. & Harland, J. (2004). The arts and social inclusion: What's the evidence? *Support for Learning*, 19, 2, 52-56.)

## 2003 What Principals Can Do

- Instead of cutting arts instruction, examine how your arts teachers can collaborate with classroom teachers so that both reinforce in their instruction the fundamental thinking and motivational skills applicable to one another's subjects.
- Incorporate quality arts learning activities into your remedial and intervention programs for at-risk students.
- Work with your teachers to examine the general and specific skills developed for various art forms, such as dance, drama, music, and visual arts, and discuss how these skills can be used and enhanced in their classrooms.
- Find time to provide joint planning by arts and classroom teachers to develop interdisciplinary lessons.
- Form partnerships with artists and arts organizations in your community to complement the work of your arts specialist and classroom teachers. Few schools have teachers skilled in all of the art forms, yet each form offers important developmental opportunities for your students if you reach beyond the school walls for help (p. 17-18).

(Deasy, R. J. (2003). Let there be music ... and ART ... and P.E.: Don't axe the arts! *Principal*, 14-18.)

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## Future Research

**2008** Suggestions from the Dana Foundation for extensions of the research:

1. Previous work has established that different neural networks are involved in various forms of the arts, such as music, visual arts, drama, and dance. Future studies should examine the degrees to which these networks are separate and overlap.
2. We also require evidence of how high motivation to pursue an art form will lead to more rapid changes in that network, and we must find out to what degree such changes may influence other forms of cognition.
3. The links between music and visual arts training and specific aspects of mathematics such as geometry need to be more profoundly explored with advanced imaging methods.
4. The link between intrinsic motivation for a specific art (e.g., music and visual arts) and sustained attention to tasks involving that art needs to be followed up with increased behavioral evidence and imaging methods that can demonstrate that changes in specific pathways are greater for higher levels of motivation.
5. The search for individual indicators of interest in and influence by training in the arts should continue to be examined by a combination of appropriate questionnaire research, used of candidate genes already identified, and whole genome scans.

Further research also should pose these questions:

1. To what degree is the link between music training, reading, and sequence learning causative? If it is causative, does it involve shaping connectivity between areas of the brain network involved?
2. Is the link between music and drama training and memory methods a causative one? If so, can we use brain imaging to determine the mechanism?
3. What is the role of careful observation and imitation in the performing arts? Can we prepare our motor system for complex dance movements by simply observing or imagining desired movements? Do the discipline and the cognitive skill to achieve this goal transfer?

(Gazzaniga, M. S. (2008). Arts and cognition: Findings hint at relationships. 2008 Progress Report on Brain Research. The Dana Press. 7-12.)

**2008** The inherent value of education in the arts has never been in question. But the potential of the arts to engage students in learning more broadly—particularly those who are not otherwise being reached—is an opportunity which demands attention (p. 107).

(Gibson, R. & Anderson, M. (2008). Touching the void: arts education research in Australia. *Asia Pacific Journal of Education*, 28, 1, 103-122.)

**2008** Although I agree with the REAP authors that arts educators must build justifications based on the inherent value of study in the arts, continuing to seek connections and links between educational experiences in dance and achievement in other subjects seems both politically wise and necessary (p. 27).

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(Hagood, T. K. (2008). Dance to read or dance to dance? *Art Education Policy Review*, 102, 5, 27-29.)

**2008** Because the essence of a dance-arts education is itself still debated—and the notion of research in and for dance-arts education is in need of great clarification—our field must engage in some substantial preliminary work and contextualization before a strategic vision for empowering future policy initiatives (including curriculum development or a more refined advocacy) may be outlined. Fundamental matters of disciplinary definition and a strategic agenda for inquiry must be addressed before we are able to provide compelling evidence for what a dance-arts education may offer America's children (p. 28). ... Whether it is dance to read, or dance to dance, we must refine a strategic vision for the future of dance in American education (p. 29).

(Hagood, T. K. (2008). Dance to read or dance to dance? *Art Education Policy Review*, 102, 5, 27-29.)

**2005** Arnold (2001) calls for new research to be done into the impact of integrated arts teaching on academic achievement, and cites the arts as a possible valuable entry point for educating under-achieving students (p. 8).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2001** ...more research needs to focus on quality arts education programs to expand our understanding of the cognitive and affective impact on students of arts study and also its impact on the learning environment of the whole school (p. 38).

(Deasy, R. J. & Fubright, H. M. (2001). The arts' impact on learning. *Education Week*, 20, 19, 34-35.)

**2001** ... schools with strong arts often reports improved academic achievement. Why? One possibility is that the same schools that treat the arts seriously institute other kinds of innovations that are favorable to academic learning. ... To discover this, researchers need to carry out ethnographic studies of exemplary schools that grant the arts a serious role in the curriculum. What kinds of innovations have been made in these schools to foster excellence? If certain innovations are always found in schools that grant the arts a serious role, this finding could account for why schools with serious arts programs have high academic performance. ... Experimental studies thus far have not tested this hypothesis. What is needed are comparisons of academically strong vs. academically at-risk students taught the same subject matter with and without the arts as entry points. Can we identify students who first experience success in the art form and subsequently go on to show heightened interest and effort in the academic subject matter? And do levels of interest and/or motivation predict later achievement in that subject matter? It is also possible that all students would benefit from an arts-integrated approach, even those who are high achievers to begin with, simply because an arts-integrated approach makes any subject more interesting. This hypothesis also deserves a rigorous test (p. 6).

(Hetland, L. & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102, 5, 3-6.)

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**2000** Training in the visual arts can lead to small improvements in visual reading readiness tests, but not in reading achievement tests. If we want to find out whether the improvement in reading readiness actually facilitates reading achievement later on, children who show improved reading readiness scores as a function of arts instruction must be followed to find out if they in fact become better readers (p. 292).

(Burger, K. & Winner, E. (2000). Instruction in visual art: Can it help children learn to read? *Journal of Aesthetic Education*, 34, 3-4, 277-293.)

**2000** When reading is taught in an engaging way, through art projects, children may become motivated to read more and this may improve their reading. But further research is still required to test this explanation. Independent measures of children's interest in reading, along with measures of reading achievement, are needed. ... Further research must compare the effectiveness of art as a motivational entry point into reading with the effectiveness of other potential motivators such as sports (p. 292).

(Burger, K. & Winner, E. (2000). Instruction in visual art: Can it help children learn to read? *Journal of Aesthetic Education*, 34, 3-4, 277-293.)

**2000** Qualitative research should explore the ways in which the arts may change the entire atmosphere of a school. This way we can begin to understand how the arts affect the "culture of learning" in a school (p. 6).

(Winner, E. & Hetland, L. (2000). The arts in education: Evaluating the evidence for a causal link. *Journal of Aesthetic Education*, 34, 3-4. 3-10.)

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## Integration

**2008** It would be unfortunate if the debate devolved into an “either/or” dispute among the disciplines, between the arts and the sciences, for instance. The development and use of the imagination cannot be confined to a single discipline nor can the content, skills and modes of thought of a single discipline satisfy the demand to develop the other skills deemed crucial to a 21st century workforce by national reports: collaboration and teamwork, critical thinking and problem solving, initiative and self-direction, the ability to communicate in multiple forms, and social and cross-cultural skills. Integrated, interdisciplinary learning is essential to developing these skills.

Specific characteristics of the arts bring multiple values to interdisciplinary work. And they bring their explicit purpose, the development and application of the imagination — the capacity to visualize new possibilities for human thought, behavior and the use of materials — and embody those visions creatively in tangible and multiple forms of communication.

For the arts to make their contribution, however, administrators and policymakers need to understand the value of moving them from the margins of school priorities and time to a more substantive role in the curriculum and life of the school.

Under the pressures of accountability testing required by states and No Child Left Behind, it's not easy for policymakers and administrators to take the risk, as Hinojosa has done, of placing some of their bets on the arts as they respond to current and new Challenges. They can draw confidence from a growing body of research clarifying the nature of learning in the arts and the intellectual, personal and social skills the arts require and nurture (p. 13-14).

(Deasy, R.J. (2008). Why the arts deserve center stage. *School Administrator*, 65, 3, 12-17.)

**2008** The interdisciplinary curriculum suggestions encourage students to develop new insights and synthesize new relationships between ideas (p. 35).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** The arts help to emphasize what must or is mandated to be learned in schools. ... the arts should be used as a means of making meaning of all that is learned. The arts may also be used as a response to what has already been learned and to help to synthesize what had been taught in schools (p. 14).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Learning through the arts, such as the use of drama to re-enact historical events or the use of paintings to introduce and analyze life in historical periods, allows students to

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learn beyond the rote recall of information (p. 16).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Drama can also be used to enhance intrapersonal intelligence. McMaster (1998) described drama as a way to develop metacognitive strategies. While students are dramatizing a particular narrative, they are continually analyzing and evaluating their work to decide whether they are convincing enough in their role. Teachers assisted with this strategy by providing questions that helped students reflect on their performances and plan for improvement on future performances. Students employed the use of visualizing as they planned for dramatic reenactments of a particular part of the text. Because visualization was an effective strategy to store information for retrieval, this process inevitably aided in comprehension (p. 18).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Drama, because of its requirement for active student involvement, encourages risk-taking while allowing students the opportunity to transform themselves into characters representative of the material they have read. This teaching strategy activity enabled students to claim ownership of the newly processed information in addition to becoming a tool for application for the new knowledge to other areas. Researchers have also noted that drama encouraged the use of skill of writing, speaking, and performing as well. The art of drama lies within the process as opposed to the product (p. 18).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Learning through the arts provides students the opportunity for constructing meaning of content related material through the use of the visual, dramatic, and musical arts while learning in the arts give students the exposure to specific skills gained through instruction in these art forms. Both roles of the arts are desired in a school based program (p. 24).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** While the arts should be recognized as subjects that can stand alone and be important in their own rights, parents and educators should also embrace the concept that the arts can enhance true understanding of a content area (p. 24).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2007** Based on a study of a large-scale project in Minneapolis, researchers concluded “the amount of arts integration matters.” More than mere exposure to the arts is necessary to affect substantial gains in learning. When teachers integrated the arts into their mathematics lessons “a lot,” for example, students showed greater gains than those who integrated “very little.” The potential for the arts to invigorate learning is demonstrated in the academic superiority of students in schools that devote 25 percent or more of the

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curriculum to arts courses (p. 11).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** This vignette highlights the qualities that made arts integrations engaging learning experiences:

**1. Integrations allowed students to use their hands, bodies, and voices in meaningful ways.**

What we typically ‘shush’ (voices) or ask to keep still (hands and bodies) become tools for learning in an arts integration lesson ... they were permitted to stand, sit, or move around the room as needed. This sense of freedom and responsibility for their own learning helped sustain their attention and encouraged perseverance with the task.

**2. Making art allowed choices about how to interact with content.**

Expressing their understanding of concepts through art led students to become more attentive to detail, more deliberate in their choices, and more thoughtful about what they considered essential, underscoring the power of art as an intellectual exercise.

**3. Integrations were social events.**

Students were free to visit with one another as long as they were working. They borrowed materials and ideas freely from each other, but this social aspect of the integration did not appear to divert anyone from the purpose of the lesson (p. 36).

(Lynch, P. (2007). Making meaning many ways: An exploratory look at integrating the arts with classroom curriculum. *Art Education*, 60, 4, 33-38.)

**2007** Supportive Elements of Art Integrations

**1. Arts integration s allowed for multiple perspectives: “I learned it is fun to be in someone else’s shoes for a while.”** No matter what their cognitive bias or learning styles/preferences might be, the arts permitted students to interpret content in ways that were meaningful to them.

**2. Arts integrations helped create a safe atmosphere for taking risks: “You don’t have to make your drawing look real ... it’s great as long as you like it.”** The principal observed, “It is the only opportunity for some of those children to attach meaning to what we’re doing ... Because they’re not understanding the language ... it’s hard for them to read a fifth grade content book, their reading level may not be fifth grade content, but they see it, they do it, they act it out, it’s fun, it’s engaging, they remember it. They’re able to attach meaning to that and build on their experiences.”

**3. Arts integrations demonstrated that learning can be a pleasurable experience: “The best thing about the arts is it is creative and fun and that’s what keeps me going and staying on track.”** ... they encourage students to explore things –with hands, bodies, and voices.

**4. The arts and regular classroom curriculum naturally complement each other. “The arts can help people for other classes such as math and science (p. 36-37).**

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(Lynch, P. (2007). Making meaning many ways: An exploratory look at integrating the arts with classroom curriculum. *Art Education*, 60, 4, 33-38.)

**2007** When the arts become a vehicle for learning classroom content, the whole child is involved. Children are immersed intellectually, emotionally, physically, and therefore rigorously, in the learning experience. ... the arts require children to assume greater responsibility for their own learning. When challenged to demonstrate their learning dramatically, visually, or musically, students must make important decisions about what is essential and what is not.... arts integrations are inclusive experiences that invite all students to participate in the learning process. Students who struggle academically experience success when given the opportunity to demonstrate their learning...(p. 37-38). (Lynch, P. (2007). Making meaning many ways: An exploratory look at integrating the arts with classroom curriculum. *Art Education*, 60, 4, 33-38.)

**2007** Both sides make a compelling case. But the evidence suggests that the stark choice between academics and the arts is a false dichotomy...recent research suggests a direct and systematic link between art experiences and literacy skills (p. 80). (Reeves, D. (2007). Academics and the arts. *Educational Leadership*, 80-81.)

**2007** Although it is increasingly common to expect music and art teachers to integrate literacy into their lessons, we also need to encourage content-area teachers to integrate the arts into their classes (p. 81). (Reeves, D. (2007). Academics and the arts. *Educational Leadership*, 80-81.)

**2006** Arts-integrated programs are associated with academic gains across the curriculum as reflected in standardized test scores, and they appear to have more powerful effects on the achievement of struggling students than more conventional arts education programs do (p. 60). (Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2006** As artists and teachers begin working together, they often design lessons and units that connect subject matter to an arts project: Students might make a quilt, with each patch representing a key idea in the U.S. Constitution, or teachers might develop letter awareness by having students “dance” letter shapes (p. 61). (Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2006** Pioneering artists and teachers in Chicago actively develop curriculum by identifying parallel processes in an art form or arts-related activity and a more traditionally academic activity, then crafting an elegant fit between these processes. For example, they might pair journal writing with sketching, reading literature with looking at art, and writing drafts with repainting (Burnaford, Aprill, & Weiss, 2001). The paired subjects engage the same cognitive processes attentive observation, identification of meaningful detail, selection of appropriate representational strategies, and student reflections, and self-critique. Setting these parallel processes in motion appears to



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generate a cognitive resonance between the two subjects, deepening learning in both. Powerful social and emotional dynamics amplify this resonance. In arts-integrated classrooms, work more often clearly and meaningfully connects to students own experiences and feelings (p. 63).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2006** In harnessing the arts to other subjects, arts integration turns the curriculum toward work that does not merely reproduce knowledge, but uses knowledge in authentic intellectual ways. This kind of work is interesting and meaningful, promotes higher levels of engagement, raises students' intrinsic standards, and motivates students to invest the energy that learning requires of them (p. 63).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2006** The best arts integration programs are developing a strategy that is helping to close the achievement gap even as it makes schools happier places. These programs successes demonstrate that this strategy is within reach of most schools, even those in the poorest communities (p. 63).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

**2006** Districts and schools should expand successful arts integration partnerships and launch new ones. They should compensate artists working in these partnerships for their high levels of experience and skill and give teachers time to plan units and lessons with artists. Principals should lead school-wide planning to bring arts integration into all classrooms and use multiple art forms in the school. Preservice teachers should learn about arts integration, and arts classes should be required for teacher certification. Art and music teachers should learn to integrate what they know about their art forms with other subjects (p. 64).

(Rabkin, N. & Redmond, R. (2006). The arts make a difference. *Educational Leadership*, 60-64.)

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## Limitations to Previous Research

**2008** Two primary issues relating to existing research approaches are the limitations of the current definitional scope of the impact of art and the corresponding lack of robust methodologies with which to interpret it (p. 22).

The approach to defining art as a function of institutions (an institutionalized perspective) generally only included the high arts or government-funded community arts programs. However, the way people experience art is broader than this (DiMaggio 2002; Guetzkow 2002; Jackson, Kabwasa-Green, and Herranz Jr. 2006; Jermyn 2001; Stern et al. 1994). Many of these broader encapsulations of art fall within the populist perspective, which incorporates popular arts, fringe arts, amateur arts, and minority and ethnic arts (Mulcahy 2006). Yet, in the study of the impact of art research, there has been limited inclusion of these populist definitions. Further, there has been little consideration of varying modes of experience (creating or passively perceiving art).

Additional methodological concerns identified during the Critique era include:

- \* A lack of consideration of negative impacts;
- \* Crude attempts to use quantitative measures as proxies for qualitative indicators;
- \* Lack of longitudinal research;
- \* Lack of evidence of causality; and
- \* Exclusive and nonrepresentative research samples (p. 22-23).

(White, R. W. & Hede, A.M. (2008). Using narrative inquiry to explore the impact of art on individuals. *The Journal of Arts Management, Law, and Society*, 38, 1, 19-3\_.)

**2007** Scientific research is held up as model, despite the acceptance of much lower effectiveness levels in scientific fields. For example, pharmaceuticals are offered as research models even though 90% of drugs only work with 30-50% of the population. Imagine proposing an educational approach that only works with one third to one half of kids. The consequences of overreliance on “scientific research” have become apparent as more and more “proven” treatments, such as silicone implants and Vioxx, have been shown to have life-threatening side effects (p. 34).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2007** A compelling argument is made that measuring complex thinking in the arts is beyond the capabilities of current tests. Hetland and Winner (2000) call the research on the arts-academics connection “inconclusive,” but make the case that the arts should not be justified by their ability to increase test scores. The arts have inherent merits such as an unquestioned ability to compel interest, induce empathy, and give new perspectives. These and many of the other important influences of the arts are not easily measured in standardized testing formats. Artistic processes resist standardization. As Eisner (2002) is quick to point out, that which is easily measured may not matter and what matters is not easy to measure. ... Scripp (2003) argues further that “one-way cause and effect” models

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of research are appropriate when it is only possible that the treatment affects the outcome. He points out, for example, that smoking causes cancer, but cancer does not cause smoking. Arts-based learning is not a one-way street. Learning in music enhances math, but math undoubtedly enriches music achievement. One-way transfer is unlikely and is a constricted view of learning. That said, most available research looks at what the arts might do for academics, not the other way around (p. 34).

(Cornett, C. E. (2007). *Creating meaning through literature and the arts*. (3<sup>rd</sup> ed.) Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.)

**2005** Here the question is whether it is simplistic to make declarations about causal links between skills learnt in an arts arena and subsequent enhanced performance in academic areas when such declarations are often based purely on the anecdotal reflections of those asked rather than on more rigorous data collection methods that may include a pre- and post-test measure (p. 9).

(Boyes, L. C. & Reid, I. (2005). What are the benefits for pupils participating in arts activities? The view from the research literature. *Research in Education*, 73, 1-14.)

**2004** Overall we found that most of the empirical research on instrumental benefits suffers from a number of conceptual and methodological limitations:

- *Weakness in empirical methods*. Many studies are based on weak methodological and analytical techniques and, as a result, have been subject to considerable criticism. For example, many of these studies do no more than establish correlations between arts involvement and the presence of certain effects in the study subjects. They do not demonstrate that arts experiences caused the effect.
- *Absence of specificity*. There is a lack of critical specifics about such issues as how the claimed benefits are produced, how they relate to different types of arts experiences, and under what circumstances and for which populations they are most likely to occur. Without these specifics, it is difficult to judge how much confidence to place in the findings and how to generalize from the empirical results.
- *Failure to consider opportunity costs*. The fact that the benefits claimed can all be produced in other ways is ignored. Cognitive benefits can be produced by better education (such as providing more-effective reading and mathematics courses), just as economic benefits can be generated by other types of social investment (such as providing more-effective reading and mathematics courses), just as economic benefits can be generated by other types of social investment (such as a new sports stadium or transportation infrastructure) (p. xiv-xv).

(McCarthy, K. F., Ondaatje, E. H., & Zakaras, L. (2004). *Gifts of the muse: Reframing the debate about the benefits of the arts*. Santa Monica, CA: RAND Corporation.)

**1999** Although there is much material published that *claims* the arts cause academic achievement scores to increase or that the arts courses “strengthen” academic performance, it is often difficult to know the basis upon which the claims are made. ... It is also of no small interest to note that what constitutes success is higher academic

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achievement scores as a result of enrolling in arts courses, not accomplishment in the arts (p. 144).

(Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

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## Obstacles/Challenges to Arts

**2008** Our culture is shaped by our language, our images, what we pay attention to and those people whom we raise to iconic status. The real contaminant in our culture today is what we choose to value and adore. Today's American icons are business titans like Bill Gates and Warren Buffet, sports stars like Michael Jordan and Tiger Woods or pop idols like Britney Spears and Paris Hilton. Our values seem to be built around wealth accumulation, sports excellence (which leads to wealth accumulation) or fame (which also seems to make one wealthy). ... The Bible says that where your treasure is, there will your heart be also. America has come to treasure treasure, and therein lies the problem. ... At the child level, what our children are taught to value comes largely from the popular culture and what our schools emphasize tends to be shaped by the economic culture of our country. The result is that we have collectively raised a generation of children that knows the price of everything and the value of nothing (p. 36).

(Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2008** "At times over the last half century, schools have been criticized for limiting America's ability to compete in the global marketplace. In the late 1950s, America's falling behind in the space race was largely blamed on our schools. There were panicked stories in the popular media about "what Ivan knows that Johnny doesn't," and there was a flurry of activity to improve America's educational standing. Money poured into schools for new programs in science and for teacher preparation.

When a mere decade later America landed men on the moon, the schools were not given much credit for this achievement. And they probably shouldn't have received credit. They were no more responsible for John Glenn and Neil Armstrong's accomplishments than they had been at fault for Russia's launching of a satellite before the United States had done so. Their space flights were the result of American ingenuity and know-how and a government that was focused on a successful outcome (p. 37). ...

Schools again are targeted as the culprits of our supposed failure to compete. And, as usual, the pundits have it all wrong. It's not the schools, it's the culture (p. 38).

(Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2008** While the United States has cut taxes that go to support education both at the state level and nationally, other countries in the world are increasing their investments in education (p. 39).

(Houston, P. D. (2008). Creating: A whole new world. *School Administrator*, 65, 3, 36-40.)

**2008** Deasy suggested what's most valued in America is "muscularity" or toughness. The math and science curricula carry with them this sense of muscularity through their

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inherent formulas, truisms and theories. By comparison, the arts experience seems less tough, softer, more anecdotal (p. 33).

(Eger, J. M. (2008). The arts in contemporary education. *School Administrator*, 65, 3, 32-35.)

**2008** NCLB requires schools to report student achievement test results for reading, mathematics, and science. Because all students must meet state-determined standards in these subjects in the next six years, the instructional time for other subjects, such as the arts, has been in serious decline. A 2007 report by the Center for Education Policy (Choices, Changes, and Challenges: Curriculum and Instruction in the NCLB Era) says about 62 percent of school districts increased the amount of time spent in elementary schools on English language arts and/or math, while 44 percent of districts cut time devoted to science, social studies, art and music and other subjects. ... 97 minutes for arts and music compared to 568 minutes for reading (p. 29).

(Rome, N. W. (2008). Collecting arts education data under NCLB. *School Administrator*, 65, 3, p. 29.)

**2008** Teachers in England use [the arts] to teach history and to advance both interpersonal and intrapersonal communication, while in the United States, the arts are typically connected with those who are particularly gifted in aesthetics (p. 13).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** Some educators view integration of the arts into the curriculum as simple activities that may be used as extras or time fillers. This misrepresentation or simplistic view of the arts tends to trivialize the importance of the process. Students should be immersed in meaningful ways with the arts throughout their school day (p. 16).

(Gullatt, D. E. (2008). Enhancing student learning through arts integration: Implications for the profession. The University of North Carolina Press. 12-25.)

**2008** We know that when we teach students in and through dance, they, well, they bloom. We know this, but we really don't know how or why. ... whether or not having had such an educational experience, Suzie reads better, or adds better, or writes better. Such connections are sought because we can measure better reading, better adding, or better writing. The problem is that we haven't determined a way to measure what better dancing does for Suzie (p. 28).

(Hagood, T. K. (2008). Dance to read or dance to dance? *Art Education Policy Review*, 102, 5, 27-29.)

**2007** Pressure to pass basic skills tests also leads teachers—often against their better judgment—to substitute “drill and kill” for “problem solving” or to forfeit real literature in favor of artificially sequenced textbooks filled with vapid, insignificant stories (p. 5).

(Finn, C. E. & Ravitch, D. (2007). Why liberal learning. In C.E. Finn & D. Ravitch (Ed.), *Beyond the basics: Achieving a liberal education for all children* (pp. 1-10). Washington, D.C.: Thomas B. Fordham Institute.)

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**2007** The challenge for school leaders is to offer every student a rich experience with the arts without sacrificing the academic opportunities students need (p. 80).

(Reeves, D. (2007). Academics and the arts. *Educational Leadership*, 80-81.)

**2001** “Of all the art forms, dance is experienced the least.” ... In terms of frequency of arts instruction, visual arts rank first, followed by music and theater; dance is in last place (p. 30).

(Black, Susan. (2001). Shall we dance? *American School Board Journal*, 30-32.)

# Arts Education Research Compendium

## Previous Research Design/Methods

**2008** One proposed research method that recognizes the nature and context of the research problem, comprises two stages:

In stage one, a narrative inquiry is employed to make the perspective of the individual central to the research. This allows for the discernment of meaningful information about how individuals define art and how they perceive its impact on them. Narrative inquiry is a mode of exploring and representing human experience regarding a phenomenon by analyzing and presenting the subjective narratives of individuals. “Narrative is retrospective meaning-the shaping or ordering of past experience. Narrative is a way of understanding one’s own and others’ actions, of organizing events into a meaningful whole and of seeing the consequences of events and actions over time.”

The methodology uses a combination of narrative interpretation (where data collected is interpreted and presented in a narrative form) and analysis of the narratives to determine themes across them. This follows the process of developing a posteriori knowledge by generating specific knowledge (individual narrative interpretation) followed by a more general understanding based on that knowledge (thematic analysis of the narratives). Stage two-Impact and Enabler Development-further explores and refines the preliminary impacts identified in stage one to assess the generalization of the findings.

The first stage of the research explored the impact of art on eight individuals, which was deemed to be sufficient within the method of narrative inquiry. The participants were asked to reflect on and respond to three primary research questions during an initial two-week data collection phase. During this period they were asked to consider how they define art, how they experience art, and what impacts resulted for them. Participants were asked to record in a diary one entry per day about their experiences and thoughts.

The participants were also asked to submit up to twelve photographs (abstract or literal) to assist them in communicating their experiences.

In-depth semistructured interviews were conducted two to four weeks after this initial data collection phase.

The first stage of analysis was the narrative interpretation, which required premeditated inference, selection, structure, and interpretation of data to produce a representation of the experience being considered (p. 24-26).

(White, R. W. & Hede, A.M. (2008). Using narrative inquiry to explore the impact of art on individuals. *The Journal of Arts Management, Law, and Society*, 38, 1, 19-3\_.)



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**1999** ... compare performance on academic measures with the number of arts courses taken. ... students would need either to be randomly selected and randomly assigned to experimental and control groups or matched on academic achievement on the relevant achievement variables. Where random selection and assignment are not feasible, gain-scores-differences between pre-experimental and post-experimental scores would be used to compare the performance of students in each group at the end of the experiment.

To know what might make a difference in the academic achievement scores between the two groups, the form and content of the experimental treatment, in this case the curriculum of the arts courses in which students in the experimental group were enrolled, would need to be monitored and described. In addition, the course aims and content of the students in academic classes would have been monitored and described to ensure that they were comparable. ... pay attention to the quality of teaching provided to students in each group (p. 145-146).

(Eisner, E. W. (1999). Does experience in the arts boost academic achievement? *The Clearing House*. 72, 3, 143-149.)

**1998** Language skills were measured using the Primary or Intermediate Test of Language Development (TOLD-2). Social skills were measured using the Walker-McConnell Scale of Social Competence and School Adjustment (WMS). The experimental group participated in twelve 40-minute sessions of creative drama which targeted each of the four social skills in three sessions each. The speech and language pathologist, who had completed courses in theatre and used drama activities in instruction, led the drama sessions on Tuesdays (intermediate groups) and Fridays (primary group) (p. 90). During the treatment period, the comparison group was involved in a traditional curriculum for social and oral language skills development (p. 91).

(de la Cruz, R. E., Lian, M.G.J., Morreau, L. E. (1998). The effects of creative drama on social and oral language skills of children with learning disabilities. *Youth Theatre Journal*, 12, 89-95.)

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## Support for the Arts

**2008** ... Nike founder—Phil Knight ... Apple's Steve Jobs ... Sidney Harman, founder of Harman Industries (a \$3 billion producer of sound systems for luxury cars, theaters, and airports, ... To Harman, Jobs and Knight, the arts mean business. These men realize that the arts are not only about aesthetics but about imaginative ideas, abstract thoughts and creative problem solving (p. 30).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

**2008** At Americans for the Arts, we launched Arts Vote 2008 to elicit arts education policy position statements from all presidential candidates, and it's working. For the first time, presidential candidates were talking during the primaries about the importance of arts education and how they will promote it. Across the country, mayors are holding press conferences announcing the economic impact of the arts in their communities. Many cities, towns and regions have announced major new initiatives around building their creative industries. Business leaders, elected officials and citizens are rallying behind these efforts (p. 30).

(Lynch, R. L. (2008). Creating a brighter workforce with the arts. *School Administrator*, 65, 3, 26-30.)

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## Theories

**2005** Monroe C. Beardsley ... theorized that works of art of some complexity and quality possess the capacity to invite aesthetic experiences that may not only relieve various degrees of tension and conflict but may also refine perception and discrimination and stimulate the imagination. If works of art can have such a positive impact on human experience, it is reasonable to suppose that they might also affect mental health positively, foster a degree of sympathy and understanding among people, and provide an ideal for human life (p. 38).

(Smith, R. A. (2005). In the humanist tradition: The RAND study on the benefits of art. *Arts Education Policy Review*, 107, 1, 37-39.)

**2000** ... researchers hypothesize that, because of neurological connections in the cortex, development of certain kinds of musical and spatial abilities are related. In particular, they argue that musical abilities are linked to “spatial-temporal” abilities, defined as processes that require mental manipulation of two- and three-dimensional objects in the absence of physical models, and that ‘music training at an early age is exercise’ for such higher brain functions as spatial-temporal reasoning (p. 180).

(Hetland, L. (2000). Learning to make music enhances spatial reasoning. *Journal of Aesthetic Education*, 34, 3-4, 179-227.)

**2000** Another theory, the “rhythm” theory proposed by Lawrence Parsons and colleagues, also suggests a neurological connection between music and spatial processes that require mental rotation, a component of spatial-temporal ability. This theory proposes that the rhythmic element of music links musical and spatial processing. Parsons goes on to argue that rhythm is processed in the cerebellum, as is mental rotation. Hence, it is possible that processing rhythm stimulates the ability to perform mental rotation tasks, with the result that music enhances spatial tasks that require mental rotation (p. 180).

(Hetland, L. (2000). Learning to make music enhances spatial reasoning. *Journal of Aesthetic Education*, 34, 3-4, 179-227.)

**2000** Making music requires coordination over extended periods of at least six of the intelligences defined by Howard Gardner in *Frames of Mind*: musical (e.g., to think with tones, melodies, and timbres), visual-spatial (e.g., to understand musical notations and spatial relations such as those depicted on keyboards), bodily-kinesthetic (i.e., to exploit both fine and gross motor skills, as in fingering and conducting), logical/mathematical (e.g., to discern patterns, note values, and part-whole relationships), interpersonal (e.g., to communicate between student and teacher, performer and ensemble, or performer and audience), and intrapersonal (e.g., to express feelings through sound). ... Because music-making and spatial abilities are both multi-dimensional processes, we might expect a range of spatial skills to improve because of direct practice during music instruction (p. 181).

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(Hetland, L. (2000). Learning to make music enhances spatial reasoning. *Journal of Aesthetic Education*, 34, 3-4, 179-227.)

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